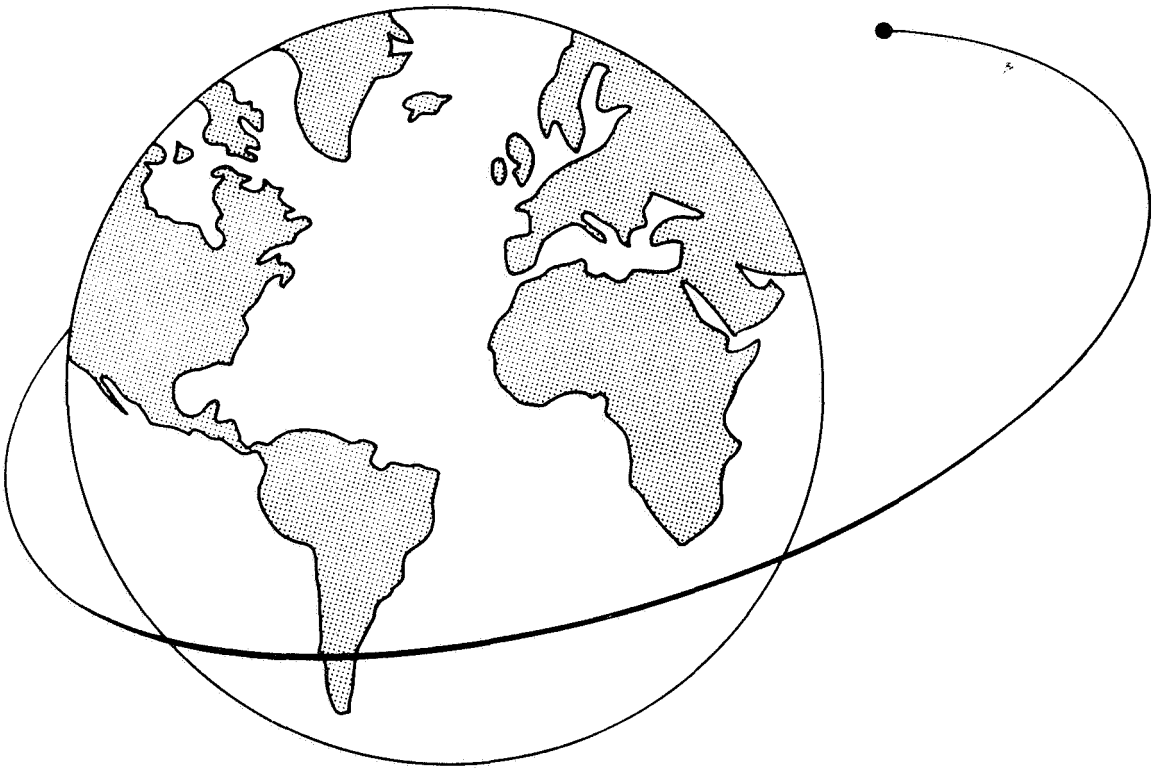
# SECOND-ORDER PLANETARY THEORY PART I



S. E. HAMID



Smithsonian Astrophysical Observatory
SPECIAL REPORT 302

Research in Space Science
SAO Special Report No. 302

# SECOND-ORDER PLANETARY THEORY

## Part I: Outline of the Method

S. E. Hamid

July 1, 1969

Smithsonian Institution
Astrophysical Observatory
Cambridge, Massachusetts 02138

TABLE OF CONTENTS

## LIST OF TABLES

## ABSTRACT

The analytical procedure for computing second-order perturbations in rectangular coordinates, according to Brouwer's theory of planetary motion, is given. Single- and double-harmonic analyses and the multiplication of Fourier series with numerical coefficients are used in the computations. In the series multiplication, a variable tolerance is considered, enabling us to avoid the difficulties arising from a small divisor.

Also presented is an example computing that part of the second-order perturbation of Mars containing the masses of Jupiter and Saturn. The analytical solution of this perturbation is compared with the numerical integration of the differential equations defining this perturbation. The numerical integration covered the interval from 0 to 40,000 days. The comparison shows an agreement within $1 \times 10^{-9}$.



## RESUME

La procédure analytique de calcul des perturbations de second ordre en coordonnées rectangulaires, d'après la théorie de Brouwer des mouvements planétaires, est exposée. Des analyses d'harmoniques simples et doubles et la multiplication de séries de Fourier avec des coëfficients numériques sont utilisées dans les calculs. Dans la multiplication de séries on tient compte d'une tolérance variable qui permet d'éviter les difficultés provenant d'un petit diviseur.

Un exemple de calcul de la perturbation de second ordre de Mars due aux masses de Jupiter et Saturne est également présenté. La solution analytique de cette perturbation est comparée avec l'intégration numérique des équations différentielles qui définissent cette perturbation. L'intégration numérique couvre l'intervalle de 0 à 40. 000 jours. La comparaison montre une concordance de $1 \times 10^{-9}$.

## Резюме

Излагается аналитический способ вычисления возбуждений второго порядка в прямоугольных координатах, согласно Брауэрской теории планетного движения. Одно- и двух-гармонические анализы и умножение серии Фоурьера с числовыми коэффициентами использованы в расчетах. При умножении серии была учитана переменная толеранция, позволяя избежать трудности, возникающие благодаря малому разделителю.

Также приведен пример вычисления Марсовых возбуждений второго порядка, содержащих массы Юпитера и Сатурна. Аналитическое решение этих возбуждений сравнено с числовой интеграцией дифференциальных уравнений, определяющих этих возбуждений. Числовая интеграция покрыла интервал от 0 до 40.000 дней. Сравнение показывает согласие в пределах $I \times 10^{-9}$.

# SECOND-ORDER PLANETARY THEORY

## Part I: Outline of the Method

S. E. Hamid

## 1. INTRODUCTION

The author has successfully applied Brouwer's theory of general perturbation in rectangular coordinates to obtain a first-order planetary theory for all the principal planets except Pluto (Hamid, 1968). The advantage of Brouwer's theory over other planetary theories is its convenience when higher order perturbations are considered.

In this report, the adaptation of the theory in the computation of second-order perturbations is discussed. General computer programs have been developed for the computation of the different second-order terms of planetary perturbations. These programs have been applied for the planet Mars to compute the second-order perturbations factored by the product of the masses of Jupiter and Saturn. The numerical results obtained have been tested successfully against the numerical integration of the differential equations satisfying these perturbations.

This work was supported in part by grant NGR 09-015-002 from the National Aeronautics and Space Administration.

## 2. THE EQUATIONS OF MOTION

Consider a set of rectangular axes, the x axis corresponding to the direction from the sun to the perihelion of the orbit of the perturbed planet at a given epoch, and the z axis perpendicular to that orbital plane at this epoch. Then, the perturbations $\delta x$, $\delta y$, $\delta z$ in the rectangular coordinates satisfy the following set of differential equations:

$$\frac{d^2\delta x}{dt^2} + \mu \frac{\delta x}{r_0^3} - \frac{3\mu x_0}{r_0^5}(x_0\,\delta x + y_0\,\delta y) = G_x \quad ,$$

$$\frac{d^2\delta y}{dt^2} + \mu \frac{\delta y}{r_0^3} - \frac{3\mu y_0}{r_0^5}(x_0\,\delta x + y_0\,\delta y) = G_y \quad ,$$

$$\frac{d^2\delta z}{dt^2} + \mu \frac{\delta z}{r_0^3} = G_z \quad . \tag{1}$$

The quantities $(x_0, y_0, z_0)$ are the coordinates of the planet, with its unperturbed orbit assumed at epoch, while $r_0$ denotes the heliocentric distance of the planet.

The functions $G_x$, $G_y$, $G_z$ can be separated into different parts of descending order of magnitude, the first part giving rise to first-order perturbations, the second part to second-order perturbations, and so on. We denote these parts by $G_{1x}$, $G_{1y}$, $G_{1z}$; $G_{2x}$, $G_{2y}$, $G_{2z}$; ..., and let $\delta x_1$, $\delta y_1$, $\delta z_1$; $\delta x_2$, $\delta y_2$, $\delta z_2$; ... be the corresponding perturbations in the rectangular coordinates.

The first-order perturbations $\delta x_1$, $\delta y_1$, $\delta z_1$ will satisfy equations (1) when the values of $G_x$, $G_y$, $G_z$ are put equal to $G_{1x}$, $G_{1y}$, $G_{1z}$, and similarly for higher order perturbations.

We consider the second-order perturbations, which are written as

$$\frac{d^2\delta x_2}{dt^2} + \mu\frac{\delta x_2}{r_0^3} - \frac{3\mu x_0}{r_0^5}(x_0\,\delta x_2 + y_0\,\delta y_2) = G_{2x} \quad ,$$

$$\frac{d^2\delta y_2}{dt^2} + \mu\frac{\delta y_2}{r_0^3} - \frac{3\mu y_0}{r_0^5}(x_0\,\delta x_2 + y_0\,\delta y_2) = G_{2y} \quad ,$$

$$\frac{d^2\delta z_2}{dt^2} + \mu\frac{\delta z_2}{r_0^3} = G_{2z} \quad . \tag{2}$$

The solution of equations (2), given by Brouwer and Clemence (1961), takes the following form:

$$\delta x_2 = \frac{\partial x_0}{\partial L_0}\int\left(\frac{\partial x_0}{\partial \omega_0}G_{2x} + \frac{\partial y_0}{\partial \omega_0}G_{2y}\right)dt - \frac{\partial x_0}{\partial \omega_0}\int\left(\frac{\partial x_0}{\partial L_0}G_{2x} + \frac{\partial y_0}{\partial L_0}G_{2y}\right)dt$$

$$+ \frac{\partial x_0}{\partial \xi_0}\int\left(\frac{\partial x_0}{\partial \eta_0}G_{2x} + \frac{\partial y_0}{\partial \eta_0}G_{2y}\right)dt - \frac{\partial x_0}{\partial \eta_0}\int\left(\frac{\partial x_0}{\partial \xi_0}G_{2x} + \frac{\partial y_0}{\partial \xi_0}G_{2y}\right)dt$$

$$- 3\mu^2 L_0^{-4}\frac{\partial x_0}{\partial \omega_0}\iint\left(\frac{\partial x_0}{\partial \omega_0}G_{2x} + \frac{\partial y_0}{\partial \omega_0}G_{2y}\right)dt^2 \quad ,$$

$$\delta y_2 = \frac{\partial y_0}{\partial L_0}\int\left(\frac{\partial x_0}{\partial \omega_0}G_{2x} + \frac{\partial y_0}{\partial \omega_0}G_{2y}\right)dt - \frac{\partial y_0}{\partial \omega_0}\int\left(\frac{\partial x_0}{\partial L_0}G_{2x} + \frac{\partial y_0}{\partial L_0}G_{2y}\right)dt$$

$$+ \frac{\partial y_0}{\partial \xi_0}\int\left(\frac{\partial x_0}{\partial \eta_0}G_{2x} + \frac{\partial y_0}{\partial \eta_0}G_{2y}\right)dt - \frac{\partial y_0}{\partial \eta_0}\int\left(\frac{\partial x_0}{\partial \xi_0}G_{2x} + \frac{\partial y_0}{\partial \xi_0}G_{2y}\right)dt$$

$$- 3\mu^2 L_0^{-4}\frac{\partial y_0}{\partial \omega_0}\iint\left(\frac{\partial x_0}{\partial \omega_0}G_{2x} + \frac{\partial y_0}{\partial \omega_0}G_{2y}\right)dt^2 \quad ,$$

$$\delta z_2 = q_2 \int q_1 G_{2z} \, dt - q_1 \int q_2 G_{2z} \, dt \quad . \tag{3}$$

For the definition of the different partial derivatives of the coordinates $x_0$, $y_0$ and of the quantities $q_1$, $q_2$, in equations (3), see Brouwer and Clemence (1961).

## 3. THE DEVELOPMENT OF $G_{2x}$, $G_{2y}$, $G_{2z}$

The expressions for $G_{2x}$, $G_{2y}$, $G_{2z}$ have the following form:

$$G_{2x} = \frac{\partial^2 R_0}{\partial x_k^2}\,\delta x_k + \frac{\partial^2 R_0}{\partial x_k\,\partial y_k}\,\delta y_k + \frac{\partial^2 R_0}{\partial x_k\,\partial z_k}\,\delta z_k$$

$$+ \sum_{j=1}^{n}\left(\frac{\partial^2 R_0}{\partial x_k\,\partial x_j}\,\delta x_j + \frac{\partial^2 R_0}{\partial x_k\,\partial y_j}\,\delta y_j + \frac{\partial^2 R_0}{\partial x_k\,\partial z_j}\,\delta z_j\right)$$

$$+ \mu\left[\left(\frac{9}{2}\,\frac{x_k}{r_k^5} - \frac{15}{2}\,\frac{x_k^3}{r_k^7}\right)\delta x_k^2 + \left(3\,\frac{y_k}{r_k^5} - 15\,\frac{x_k^2 y_k}{r_k^7}\right)\delta x_k\,\delta y_k\right.$$

$$\left.+\left(\frac{3}{2}\,\frac{x_k}{r_k^5} - \frac{15}{2}\,\frac{x_k y_k^2}{r_k^7}\right)\delta y_k^2 + \frac{3}{2}\,\frac{x_k}{r_k^5}\,\delta z_k^2\right]$$

$$G_{2y} = \frac{\partial^2 R_0}{\partial y_k\,\partial x_k}\,\delta x_k + \frac{\partial^2 R_0}{\partial y_k^2}\,\delta y_k + \frac{\partial^2 R_0}{\partial y_k\,\partial z_k}\,\delta z_k$$

$$+ \sum_{j=1}^{n}\left(\frac{\partial^2 R_0}{\partial y_k\,\partial x_j}\,\delta x_j + \frac{\partial^2 R_0}{\partial y_k\,\partial y_j}\,\delta y_j + \frac{\partial^2 R_0}{\partial y_k\,\partial z_j}\,\delta z_j\right)$$

$$+ \mu\left[\left(\frac{3}{2}\,\frac{y_k}{r_k^5} - \frac{15}{2}\,\frac{x_k^2 y_k}{r_k^7}\right)\delta x_k^2 + \left(3\,\frac{x_k}{r_k^5} - 15\,\frac{x_k y_k^2}{r_k^7}\right)\delta x_k\,\delta y_k\right.$$

$$+\left(\frac{9}{2}\frac{y_k}{r_k^5}-\frac{15}{2}\frac{y_k^3}{r_k^7}\right)\delta y_k^2+\frac{3}{2}\frac{y_k}{r_k^5}\delta z_k^2\Bigg] \quad ,$$

$$G_{2z}=\frac{\partial^2 R_0}{\partial z_k\,\partial x_k}\delta x_k+\frac{\partial^2 R_0}{\partial z_k\,\partial y_k}\delta y_k+\frac{\partial^2 R_0}{\partial z_k^2}\delta z_k$$

$$+\sum_{j=1}^{n}\left(\frac{\partial^2 R_0}{\partial z_k\,\partial x_j}\delta x_j+\frac{\partial^2 R_0}{\partial z_k\,\partial y_j}\delta y_j+\frac{\partial^2 R_0}{\partial z_k\,\partial z_j}\delta z_j\right)$$

$$+\mu\left(3\frac{x_k}{r_k^5}\delta x_k\delta z_k+3\frac{y_k}{r_k^5}\delta y_k\delta z_k\right) \quad . \qquad (4)$$

In equations (4), we have

$x_j, y_j, z_j$ = the rectangular coordinates of the disturbing planet j, with its unperturbed orbit assumed at epoch;

$x_k, y_k, z_k$ = the rectangular coordinates of the disturbed planet k, with its unperturbed orbit assumed at epoch. Note that $x_k = x_0$, $y_k = y_0$, $z_k = 0$;

$\delta x_k$, $\delta y_k$, $\delta z_k$ = the perturbations in the rectangular coordinates of the disturbed planet k;

$\delta x_j$, $\delta y_j$, $\delta z_j$ = the perturbations in the rectangular coordinates of the disturbing planet j;

$\mu = k^2(1+m_k)$, where k is the gaussian constant and $m_k$ is the mass of the disturbed planet k;

$R_0$ = the well-known disturbing function of the different disturbing planets on planet k, given by

$$R_0 = k^2 \sum_{j \neq k} m_j \left( \frac{1}{\Delta_{kj}} - \frac{x_k x_j + y_k y_j + z_k z_j}{r_j^3} \right) \quad , \tag{5}$$

where $\Delta_{kj}$ is the mutual distance of planets k and j, and $r_j$ is the heliocentric distance of planet j.

We note that $\sum_{j \neq k}$ represents the sum over all the disturbing planets j. For example, if we consider the theory of Mars, then we have k = 4, and j will take the numbers 1, 2, 3, 5, 6, 7, 8, corresponding to the effects of Mercury, Venus, Earth, Jupiter, Saturn, Uranus, and Neptune. In this report, we shall exclude the effect of Pluto.

For the perturbations $\delta x_k$, $\delta y_k$, $\delta z_k$ and $\delta x_j$, $\delta y_j$, $\delta z_j$, we shall consider the values derived from the first-order theory. The $\delta x_k$, $\delta y_k$, $\delta z_k$ are composed of different parts, owing to the perturbations of the different disturbing planets.

If we let $F_{1k}(jk)$, $F_{2k}(jk)$, $F_{3k}(jk)$ be, respectively, the first-order perturbations in $\delta x_k$, $\delta y_k$, $\delta z_k$ due to the disturbing planet j, then,

$$\delta x_k = \sum_{j \neq k} F_{1k}(jk) \quad ,$$

$$\delta y_k = \sum_{j \neq k} F_{2k}(jk) \quad ,$$

$$\delta z_k = \sum_{j \neq k} F_{3k}(jk) \quad . \tag{6}$$

Similarly,

$$\delta x_j = \sum_{i \neq j} F_{1j}(ij) \quad ,$$

$$\delta y_j = \sum_{i \neq j} F_{2j}(ij) \quad ,$$

$$\delta z_j = \sum_{i \neq j} F_{3j}(ij) \quad . \tag{7}$$

The coefficients of $\delta x_k$, $\delta y_k$, $\delta z_k$ in equations (4) can be written as follows:

$$\frac{\partial^2 R_0}{\partial x_k^2} = \sum_{j \neq k} \phi_{x1}(jk) \quad , \quad \frac{\partial^2 R_0}{\partial y_k \partial x_k} = \sum_{j \neq k} \phi_{y1}(jk) \quad , \quad \frac{\partial^2 R_0}{\partial z_k \partial x_k} = \sum_{j \neq k} \phi_{z1}(jk) \quad ,$$

$$\frac{\partial^2 R_0}{\partial x_k \partial y_k} = \sum_{j \neq k} \phi_{x2}(jk) \quad , \quad \frac{\partial^2 R_0}{\partial y_k^2} = \sum_{j \neq k} \phi_{y2}(jk) \quad , \quad \frac{\partial^2 R_0}{\partial z_k \partial y_k} = \sum_{j \neq k} \phi_{z2}(jk) \quad ,$$

$$\frac{\partial^2 R_0}{\partial x_k \partial z_k} = \sum_{j \neq k} \phi_{x3}(jk) \quad , \quad \frac{\partial^2 R_0}{\partial y_k \partial z_k} = \sum_{j \neq k} \phi_{y3}(jk) \quad , \quad \frac{\partial^2 R_0}{\partial z_k^2} = \sum_{j \neq k} \phi_{z3}(jk) \quad , \tag{8}$$

where

$$\phi_{x1}(jk) = k^2 m_j \left[ - \frac{1}{\Delta_{kj}^3} + \frac{3(x_j - x_k)^2}{\Delta_{kj}^5} \right] \quad ,$$

$$\phi_{x2}(jk) = k^2 m_j \frac{3(x_j - x_k)(y_j - y_k)}{\Delta_{kj}^5} \quad ,$$

$$\phi_{x3}(jk) = \frac{k^2 m_j 3(x_j - x_k) z_j}{\Delta_{kj}^5} \quad ,$$

$$\phi_{y2}(jk) = k^2 m_j \left[ - \frac{1}{\Delta_{kj}^3} + \frac{3(y_j - y_k)^2}{\Delta_{kj}^5} \right] \quad ,$$

$$\phi_{y3}(jk) = k^2 m_j \frac{3(y_j - y_k) z_j}{\Delta_{kj}^5} ,$$

$$\phi_{z3}(jk) = k^2 m_j \left( - \frac{1}{\Delta_{kj}^3} + \frac{3z_j^2}{\Delta_{kj}^5} \right) ,$$

$$\phi_{y1}(jk) = \phi_{x2}(jk) ,$$

$$\phi_{z1}(jk) = \phi_{x3}(jk) ,$$

$$\phi_{z2}(jk) = \phi_{y3}(jk) . \qquad (9)$$

The coefficients of $\delta x_j$, $\delta y_j$, $\delta z_j$ in equations (4) can be written

$$\frac{\partial^2 R_0}{\partial x_k \partial x_j} = \theta_{x1}(jk) , \qquad \frac{\partial^2 R_0}{\partial y_k \partial x_j} = \theta_{y1}(jk) , \qquad \frac{\partial^2 R_0}{\partial z_k \partial x_j} = \theta_{z1}(jk) ,$$

$$\frac{\partial^2 R_0}{\partial x_k \partial y_j} = \theta_{x2}(jk) , \qquad \frac{\partial^2 R_0}{\partial y_k \partial y_j} = \theta_{y2}(jk) , \qquad \frac{\partial^2 R_0}{\partial z_k \partial y_j} = \theta_{z2}(jk) ,$$

$$\frac{\partial^2 R_0}{\partial x_k \partial z_j} = \theta_{x3}(jk) , \qquad \frac{\partial^2 R_0}{\partial y_k \partial z_j} = \theta_{y3}(jk) , \qquad \frac{\partial^2 R_0}{\partial z_k \partial z_j} = \theta_{z3}(jk) , \qquad (10)$$

where

$$\theta_{x1}(jk) = k^2 m_j \left[ \left( \frac{1}{\Delta_{kj}^3} - \frac{1}{r_j^3} \right) + \frac{3x_j^2}{r_j^5} - \frac{3(x_j - x_k)^2}{\Delta_{kj}^5} \right] ,$$

$$\theta_{x2}(jk) = k^2 m_j \left[ - \frac{3(x_j - x_k)(y_j - y_k)}{\Delta_{kj}^5} + \frac{3x_j y_j}{r_j^5} \right] ,$$

$$\theta_{x3}(jk) = k^2 m_j \left[ - \frac{3(x_j - x_k)z_j}{\Delta_{kj}^5} + \frac{3x_j z_j}{r_j^5} \right] ,$$

$$\theta_{y2}(jk) = k^2 m_j \left[ \left( \frac{1}{\Delta_{kj}^3} - \frac{1}{r_j^3} \right) - \frac{3(y_j - y_k)^2}{\Delta_{kj}^5} + \frac{3y_j^2}{r_j^5} \right] ,$$

$$\theta_{y3}(jk) = k^2 m_j \left[ - \frac{3(y_j - y_k)z_j}{\Delta_{kj}^5} + \frac{3y_j z_j}{r_j^5} \right] ,$$

$$\theta_{z3}(jk) = k^2 m_j \left[ \left( \frac{1}{\Delta_{kj}^3} - \frac{1}{r_j^3} \right) - \frac{3z_j^2}{\Delta_{kj}^5} + \frac{3z_j^2}{r_j^5} \right] ,$$

$$\theta_{y1}(jk) = \theta_{x2}(jk) ,$$

$$\theta_{z1}(jk) = \theta_{x3}(jk) ,$$

$$\theta_{z2}(jk) = \theta_{y3}(jk) . \qquad (11)$$

Finally, the coefficients of $(\delta x_k)^2$, $(\delta y_k)^2$, $(\delta z_k)^2$, $\delta x_k \delta y_k$, $\delta x_k \delta z_k$, $\delta y_k \delta z_k$ in equations (4) can be rewritten as follows:

$$\psi_{x1}(k) = \mu \left( 4.5 \frac{x_k}{r_k^5} - 7.5 \frac{x_k^3}{r_k^7} \right) ,$$

$$\psi_{x2}(k) = \mu \left( 3 \frac{y_k}{r_k^5} - 15 \frac{x_k^2 y_k}{r_k^7} \right) ,$$

$$\psi_{x3}(k) = \mu \left( 1.5 \frac{x_k}{r_k^5} - 7.5 \frac{x_k y_k^2}{r_k^7} \right) ,$$

$$\psi_{x4}(k) = \mu \, 1.5 \frac{x_k}{r_k^5} ,$$

$$\psi_{y1}(k) = \mu \left( 1.5 \frac{y_k}{r_k^5} - 7.5 \frac{x_k^2 y_k}{r_k^7} \right) ,$$

$$\psi_{y2}(k) = \mu \left( 3 \frac{x_k}{r_k^5} - 15 \frac{x_k y_k^2}{r_k^7} \right) ,$$

$$\psi_{y3}(k) = \mu \left( 4.5 \frac{y_k}{r_k^5} - 7.5 \frac{y_k^3}{r_k^7} \right) ,$$

$$\psi_{y4}(k) = \mu \, 1.5 \frac{y_k}{r_k^5} ,$$

$$\psi_{z1}(k) = \mu \, 3 \frac{x_k}{r_k^5} ,$$

$$\psi_{z2}(k) = \mu \, 3 \frac{y_k}{r_k^5} . \qquad (12)$$

With the above definitions of the various coefficients in equations (4), we have the following:

$$G_{2x} = \sum_{j\neq k} \phi_{x1}(jk) \sum_{j\neq k} F_{1k}(jk) + \sum_{j\neq k} \phi_{x2}(jk) \sum_{j\neq k} F_{2k}(jk)$$

$$+ \sum_{j\neq k} \phi_{x3}(jk) \sum_{j\neq k} F_{3k}(jk)$$

$$+ \sum_{j\neq k} \left[ \theta_{x1}(jk) \sum_{i\neq j} F_{1j}(ij) + \theta_{x2}(jk) \sum_{i\neq j} F_{2j}(ij) + \theta_{x3}(jk) \sum_{i\neq j} F_{3j}(ij) \right]$$

$$+ \psi_{x1}(k) \left[ \sum_{j\neq k} F_{1k}(jk) \right]^2 + \psi_{x2}(k) \left[ \sum_{j\neq k} F_{1k}(jk) \right] \left[ \sum_{j\neq k} F_{2k}(jk) \right]$$

$$+ \psi_{x3}(k) \left[ \sum_{j\neq k} F_{2k}(jk) \right]^2 + \psi_{x4}(k) \left[ \sum_{j\neq k} F_{3k}(jk) \right]^2 ,$$

$$G_{2y} = \sum_{j\neq k} \phi_{y1}(jk) \sum_{j\neq k} F_{1k}(jk) + \sum_{j\neq k} \phi_{y2}(jk) \sum_{j\neq k} F_{2k}(jk)$$

$$+ \sum_{j\neq k} \phi_{y3}(jk) \sum_{j\neq k} F_{3k}(jk)$$

$$+ \sum_{j\neq k} \left[ \theta_{y1}(jk) \sum_{i\neq j} F_{1j}(ij) + \theta_{y2}(jk) \sum_{i\neq j} F_{2j}(ij) + \theta_{y3}(jk) \sum_{i\neq j} F_{3j}(ij) \right]$$

$$+ \psi_{y1}(k)\left[\sum_{j\neq k} F_{1k}(jk)\right]^2 + \psi_{y2}(k)\left[\sum_{j\neq k} F_{1k}(jk)\right]\left[\sum_{j\neq k} F_{2k}(jk)\right]$$

$$+ \psi_{y3}(k)\left[\sum_{j\neq k} F_{2k}(jk)\right]^2 + \psi_{y4}(k)\left[\sum_{j\neq k} F_{3k}(jk)\right]^2 ,$$

$$G_{2z} = \sum_{j\neq k} \phi_{z1}(jk) \sum_{j\neq k} F_{1k}(jk) + \sum_{j\neq k} \phi_{z2}(jk) \sum_{j\neq k} F_{2k}(jk)$$

$$+ \sum_{j\neq k} \phi_{z3}(jk) \sum_{j\neq k} F_{3k}(jk)$$

$$+ \sum_{j\neq k}\left[\theta_{z1}(jk) \sum_{i\neq j} F_{1j}(ij) + \theta_{z2}(jk) \sum_{i\neq j} F_{2j}(ij) + \theta_{z3}(jk) \sum_{i\neq j} F_{3j}(ij)\right]$$

$$+ \psi_{z1}(k)\left[\sum_{j\neq k} F_{1k}(jk)\right]\left[\sum_{j\neq k} F_{3k}(jk)\right]$$

$$+ \psi_{z2}(k)\left[\sum_{j\neq k} F_{2k}(jk)\right]\left[\sum_{j\neq k} F_{3k}(jk)\right] \qquad (13)$$

Let us now look more closely at the different terms defining the quantities $G_{2x}$, $G_{2y}$, $G_{2z}$. The $\phi$ and $\theta$ terms can be represented by double Fourier series in the mean anomalies $\ell_k$, $\ell_j$ of the disturbed planet k and the disturbing planet j. These series can be obtained by computing the special numerical values of $\phi$ and $\theta$ for different combinations of equidistant values of the mean anomalies $\ell_k$, $\ell_j$. These special values are then subjected to double-harmonic analysis.

The $\psi$ terms can be represented by Fourier series in one argument, the mean anomaly $\ell_k$ of the disturbed planet k. These series can be obtained by computing the special numerical values of $\psi$ for different equidistant values of the mean anomaly $\ell_k$ and then subjecting these values to single-harmonic analysis.

In other words, by expressing the $\phi$, $\theta$, and $\psi$ terms as Fourier series in the mean anomalies, we can avoid analytical expansions. Only double- and single-harmonic-analysis techniques can be applied. This is what we have done in the present work. In fact, a general computer program can be constructed to have as output the Fourier representations of the different $\phi$, $\theta$, and $\psi$ terms for any given values of j, k.

The terms $F_{1k}(jk)$, $F_{2k}(jk)$, $F_{3k}(jk)$ have already been obtained in the first-order theory. It should be remembered that these perturbations in rectangular coordinates are composed of two parts: the periodic and the secular. The periodic part is represented as double Fourier series in the mean anomalies $\ell_j$, $\ell_k$, and the secular part by the product of the time t (measured from the given epoch) and a single Fourier series in the mean anomaly $\ell_k$. Let the periodic part be denoted by $f_{1k}(jk)$, $f_{2k}(jk)$, $f_{3k}(jk)$, and the secular part, by $t\,S_{1jk}(k)$, $t\,S_{2jk}(k)$, $t\,S_{3jk}(k)$. Hence,

$$F_{ik}(jk) = f_{ik}(jk) + t\,S_{ijk}(k) \quad , \tag{14}$$

where i = 1, 2, 3.

Let us consider the part $\sum_{j\neq k} \phi_{x1}(jk)$. From the above remarks, this part is represented by the summation of different Fourier series, and each series is represented in the mean anomalies $\ell_j$ and $\ell_k$. For example, if we are considering the theory of Mars, we have k = 4, and $\sum_{j\neq k} \phi_{x1}(jk)$ will be composed of the sum of seven Fourier series: the first series in $\ell_1$, $\ell_4$, the mean anomalies of Mercury and Mars; the second series in $\ell_2$, $\ell_4$, the mean anomalies of Venus and Mars; and so on. Similarly, the part $\sum_{j\neq k} F_{1k}(jk)$ is composed of the sum of different Fourier series, and each series is

expanded in the mean anomalies $\ell_j$, $\ell_k$. In addition to these Fourier series, this part contains a term t multiplied by a Fourier series in single argument $\ell_k$, the mean anomaly of the disturbed planet. In fact, for i = 1, 2, 3,

$$\sum_{j\neq k} F_{ik}(jk) = \sum_{j\neq k} f_{ik}(jk) + t\, S_{ik}(k) \quad , \tag{15}$$

where

$$S_{ik}(k) = \sum_{j\neq k} S_{ijk}(k) \quad .$$

We note that $t\, S_{1k}(k)$, $t\, S_{2k}(k)$, $t\, S_{3k}(k)$ are the total secular perturbations in rectangular coordinates of all the disturbing planets on planet k.

Similar considerations apply for the different parts of equations (13). Hence, $G_{2x}$, $G_{2y}$, $G_{2z}$ can be represented by the following equations:

$$G_{2x} = G_{2xktt}(k) \cdot t^2 + \sum_{j\neq k} [G_{2xjkt}(jk) \cdot t + G_{2xjk}(jk)]$$

$$+ \sum_j \sum_m G_{2xmjk}(mjk) \quad ,$$

$$G_{2y} = G_{2yktt}(k) \cdot t^2 + \sum_{j\neq k} [G_{2yjkt}(jk) \cdot t + G_{2yjk}(jk)]$$

$$+ \sum_j \sum_m G_{2ymjk}(mjk) \quad ,$$

$$G_{2z} = G_{2zktt}(k) \cdot t^2 + \sum_{j \neq k} [G_{2zjkt}(jk) \cdot t + G_{2zjk}(jk)]$$

$$+ \sum_{j} \sum_{m} G_{2zmjk}(mjk) \quad , \tag{16}$$

where G(k), G(jk), and G(mjk), appearing on the right-hand side of equations (16), denote, respectively, Fourier series in one argument, the mean anomaly $\ell_k$; in two arguments, the mean anomalies $\ell_j$, $\ell_k$; and in three arguments, the mean anomalies $\ell_m$, $\ell_j$, $\ell_k$. The double summation $\sum_j \sum_m$ means that m and j take the values corresponding to all the disturbing planets, excluding m = j and avoiding double counting.

Following are the expressions for the different G(mjk) in equations (16):

$$G_{2qmjk}(mjk) = \sum_{i=1}^{3} [\phi_{qi}(jk)\, f_{ik}(mk) + \phi_{qi}(mk)\, f_{ik}(jk) + \theta_{qi}(jk)\, f_{ij}(mj)$$

$$+ \theta_{qi}(mk)\, f_{im}(jm)] + 2\psi_{q1}(k)\, f_{1k}(jk)\, f_{1k}(mk)$$

$$+ \psi_{q2}(k)[f_{1k}(jk)\, f_{2k}(mk) + f_{1k}(mk)\, f_{2k}(jk)]$$

$$+ 2\psi_{q3}(k)\, f_{2k}(jk)\, f_{2k}(mk) + 2\psi_{q4}(k)\, f_{3k}(jk)\, f_{3k}(mk) \quad ,$$

where q = x, y, and

$$G_{2zmjk}(mjk) = \sum_{i=1}^{3} [\phi_{zi}(jk)\, f_{ik}(mk) + \phi_{zi}(mk)\, f_{ik}(jk)$$

$$+ \theta_{zi}(jk)\, f_{ij}(mj) + \theta_{zi}(mk)\, f_{im}(jm)]$$

$$+ \psi_{z1}(k)[f_{1k}(jk)\ f_{3k}(mk) + f_{1k}(mk)\ f_{3k}(jk)]$$

$$+ \psi_{z2}(k)[f_{2k}(jk)\ f_{3k}(mk) + f_{2k}(mk)\ f_{3k}(jk)] \quad . \qquad (17)$$

The terms G(jk) (not multiplied by t) in equations (16) are expressed as follows:

$$G_{2qjk}(jk) = \sum_{i=1}^{3} [\phi_{qi}(jk)\ f_{ik}(jk) + \theta_{qi}(jk)\ f_{ij}(kj)] + \psi_{q1}(k)\ f_{1k}^2(jk)$$

$$+ \psi_{q2}(k)\ f_{1k}(jk)\ f_{2k}(jk) + \psi_{q3}(k)\ f_{2k}^2(jk) + \psi_{q4}(k)\ f_{3k}^2(jk) \quad ,$$

where q = x, y, and

$$G_{2zjk}(jk) = \sum_{i=1}^{3} [\phi_{zi}(jk)\ f_{ik}(jk) + \theta_{zi}(jk)\ f_{ij}(kj)] + \psi_{z1k} f_{1k}(jk)\ f_{3k}(jk)$$

$$+ \psi_{z2}(k)\ f_{2k}(jk)\ f_{3k}(jk) \quad . \qquad (18)$$

The terms G(jk) (multiplied by t) take the following forms:

$$G_{2qjkt}(jk) = \sum_{i=1}^{3} [\phi_{qi}(jk)\ S_{ik}(k) + \theta_{qi}(jk)\ S_{ij}(j)] + 2\psi_{q1}(k)\ f_{1k}(jk)\ S_{1k}(k)$$

$$+ \psi_{q2}(k)[f_{1k}(jk)\ S_{2k}(k) + f_{2k}(jk)\ S_{1k}(k)]$$

$$+ 2\psi_{q3}(k)\ f_{2k}(jk)\ S_{2k}(k) + 2\psi_{q4}(k)\ f_{3k}(jk)\ S_{3k}(k) \quad ,$$

where q = x, y, and

$$G_{2zjkt}(jk) = \sum_{i=1}^{3} [\phi_{zi}(jk)\, S_{ik}(k) + \theta_{zi}(jk)\, S_{ij}(j)]$$

$$+ \psi_{z1}(k)[f_{1k}(jk)\, S_{3k}(k) + f_{3k}(jk)\, S_{1k}(k)]$$

$$+ \psi_{z2}(k)[f_{2k}(jk)\, S_{3k}(k) + f_{3k}(jk)\, S_{2k}(k)] \qquad (19)$$

For the terms with coefficient $t^2$ in equations (16), we have

$$G_{2qktt}(k) = \psi_{q1}(k)\, S_{1k}^2(k) + \psi_{q2}(k)\, S_{1k}(k)\, S_{2k}(k)$$

$$+ \psi_{q3}(k)\, S_{2k}^2(k) + \psi_{q4}(k)\, S_{3k}^2(k) \quad ,$$

where q = x, y, and

$$G_{2zktt}(k) = \psi_{z1}(k)\, S_{1k}(k)\, S_{3k}(k) + \psi_{z2}(k)\, S_{2k}(k)\, S_{3k}(k) \quad . \qquad (20)$$

In equations (17) to (20), all the different terms on the right-hand side are expressed in Fourier series in the mean anomalies $\ell_m$, $\ell_j$, $\ell_k$. We have already outlined how we obtain these series. We are now in a position to evaluate the Fourier representations in mean anomalies of the functions $G_{2qmjk}(mjk)$, $G_{2qjk}(jk)$, $G_{2qjkt}$, $G_{2qktt}$, where q denotes the parameters x, y, and z.

Let us consider, for example, $G_{2qmjk}(mjk)$, whose expressions are given in equations (17). Since we have the Fourier series for all the terms appearing in the right-hand side of equations (17), we can, by the technique of multiplying Fourier series, obtain the Fourier series representing $G_{2qmjk}(mjk)$. In this case, we did not resort to triple-harmonic analysis because it would have been excessively laborious. In fact, we constructed

a general computer program that has as input the numerical values of m, j, and k and that will give as output the Fourier representations of $G_{2qmjk}(mjk)$ in the mean anomalies $\ell_m$, $\ell_j$, $\ell_k$ (q denotes the values x, y, and z).

In computing the Fourier representations of $G_{2qjkt}(jk)$ and $G_{2qjk}(jk)$ for q = x, y, z, we can use the double-harmonic-analysis approach or the multiplication-of-series approach. To compute the Fourier representations of $G_{2qktr}(k)$ for q = x, y, z, we can very conveniently use the single-harmonic-analysis technique.

In our work, we have a general program that, for given j, k as input, produces as intermediate output the Fourier representations of $G_{2qjkt}(jk)$, $G_{2qjk}(jk)$, and $G_{2qktt}(k)$ for q = x, y, z.

## 4. THE DECOMPOSITION OF $\delta x_2$, $\delta y_2$, $\delta z_2$

In the previous section, we developed the different components of the functions $G_{2x}$, $G_{2y}$, $G_{2j}$. We found that these functions are generally composed of the summation of the following series:

A. Fourier series in three arguments.
B. Fourier series in two arguments.
C. Fourier series in two arguments, multiplied by the time t.
D. Fourier series in one argument, multiplied by $t^2$.

By substituting the general expressions of $G_{2x}$, $G_{2y}$, $G_{2z}$ in equations (3), we can see that $\delta_{x2}$, $\delta_{y2}$, $\delta_{z2}$ will be composed of the following different parts, where q takes the values x, y, z:

A. Fourier series in three argument ($\ell_m$, $\ell_j$, $\ell_k$), denoted by $\delta q_{2mjk}(mjk)$.
B. Fourier series in two arguments ($\ell_j$, $\ell_k$), denoted by $\delta q_{2jk}(jk)$.
C. Fourier series in two arguments ($\ell_j$, $\ell_k$) multiplied by the time t, denoted by $\delta q_{2jkt}(jk)$.
D. Fourier series in one argument ($\ell_k$) denoted by $\delta q_{2k}(k)$.
E. Fourier series in one argument ($\ell_k$) multiplied by t, denoted by $\delta q_{2kt}(k)$.
F. Fourier series in one argument ($\ell_k$) multiplied by $t^2$, denoted by $\delta q_{2ktt}(k)$.
G. Fourier series in one argument ($\ell_k$) multiplied by $t^3$, denoted by $\delta q_{2kttt}(k)$.
H. Fourier series in one argument ($\ell_k$) multiplied by $t^4$, denoted by $\delta q_{2ktttt}(k)$.

We must remember that $\ell_k$ is the mean anomaly of the disturbed planet, and $\ell_m$, $\ell_j$ are the mean anomalies of the disturbing planets m, j.

In order to present more conveniently the equations defining the various parts of $\delta x_2$, $\delta y_2$, $\delta z_2$, let us put

$$\sum_{\alpha,\beta} \frac{\partial q}{\partial a} \int \left( \frac{\partial x_0}{\partial \beta} G_{2x} + \frac{\partial y_0}{\partial \beta} G_{2y} \right) dt$$

$$= \frac{\partial q}{\partial L_0} \int \left( \frac{\partial x_0}{\partial \omega_0} G_{2x} + \frac{\partial y_0}{\partial \omega_0} G_{2y} \right) dt - \frac{\partial q}{\partial \omega_0} \int \left( \frac{\partial x_0}{\partial L_0} G_{2x} + \frac{\partial y_0}{\partial L_0} G_{2y} \right) dt$$

$$+ \frac{\partial q}{\partial \xi_0} \int \left( \frac{\partial x_0}{\partial \eta_0} G_{2x} + \frac{\partial y_0}{\partial \eta_0} G_{2y} \right) dt$$

$$- \frac{\partial q}{\partial \eta_0} \int \left( \frac{\partial x_0}{\partial \xi_0} G_{2x} + \frac{\partial y_0}{\partial \xi_0} G_{2y} \right) dt \quad , \tag{21}$$

for q = x, y. With this abbreviated notation, we have

$$\delta q_{2mjk}(mjk) = \sum_{\alpha,\beta} \frac{\partial q}{\partial a} \int \left[ \frac{\partial x_0}{\partial \beta} G_{2xmjk}(mjk) + \frac{\partial y_0}{\partial \beta} G_{2ymjk}(mjk) \right] dt$$

$$- 3 \mu^2 L_0^{-4} \frac{\partial q}{\partial \omega_0} \iint \left[ \frac{\partial x_0}{\partial \omega_0} G_{2xmjk}(mjk) + \frac{\partial y_0}{\partial \omega_0} G_{2ymjk}(mjk) \right] dt^2 ,$$

where q = x, y, and

$$\delta z_{2mjk}(mjk) = q_2 \int q_1 G_{2zmjk}(mjk)\, dt - q_1 \int q_2 G_{2zmjk}(mjk)\, dt \quad . \tag{22}$$

The integrands on the right side of equations (22) can now be developed in Fourier series. Integrating these Fourier representations, we obtain other Fourier representations of the integrals. Multiplying these Fourier representations by the Fourier series representing the coefficients $\partial q/\partial a$, $-3\,\mu^2\,L_0^{-4}(\partial q/\partial \omega_0)$, $q_2$, $-q_1$, and adding the different results, we obtain the Fourier representation $\delta x_{2mjk}(mjk)$, $\delta y_{2mjk}(mjk)$, $\delta z_{2mjk}(mjk)$. We note that the constant coefficient in the Fourier series representing these different integrands, i. e., the coefficients of the argument 0, will, when integrated once, give rise to a numerical coefficient multiplied by t; when integrated twice, it will give rise to a numerical coefficient multiplied by $t^2$. Hence, the final representations of $\delta q_{2mjk}(mjk)$ will contain, besides the purely periodic terms given by the Fourier representations in three arguments, mixed terms composed of the time t multiplied by Fourier series in one argument and, in the case of q = x, y only, the square of the time ($t^2$) multiplied by Fourier series in one argument. These mixed terms will be added to the perturbations $\delta q_{2kt}(k)$, $\delta q_{2ktt}(k)$.

A computer program has been constructed with the series $G_{2xmjk}(mjk)$, $G_{2ymjk}(mjk)$, $G_{2zmjk}(mjk)$ as input and, as output, Fourier representations $\delta x_{2mjk}(mjk)$, $\delta y_{2mjk}(mjk)$, $\delta z_{2mjk}(mjk)$ and the corresponding mixed terms in $\delta x_{2kt}(k)$, $\delta y_{2kt}(k)$, $\delta z_{2kt}(k)$, $\delta x_{2ktt}(k)$, $\delta y_{2ktt}(k)$.

For the evaluation of $\delta q_{2jk}(jk)$, $\delta q_{2jkt}(jk)$, for q = x, y, z, we must recall the following relations:

$$\int t\,f\,dt = t\int f\,dt - \iint f\,dt^2 \quad ,$$

$$\iint t\,f\,dt^2 = t\iint f\,dt^2 - 2\iiint f\,dt^3 \quad , \tag{23}$$

where f is any function of time t. The equations defining $\delta q_{2jk}(jk)$ will be given by

$$\delta q_{2jk}(jk) = \sum_{\alpha,\beta} \frac{\partial q}{\partial \alpha} \int \left[ \frac{\partial x_0}{\partial \beta} G_{2xjk}(jk) + \frac{\partial y_0}{\partial \beta} G_{2yjk}(jk) \right] dt$$

$$- 3 \mu^2 L_0^{-4} \frac{\partial q}{\partial \omega_0} \iint \left[ \frac{\partial x_0}{\partial \omega_0} G_{2xjk}(jk) + \frac{\partial y_0}{\partial \omega_0} G_{2yjk}(jk) \right] dt^2$$

$$- \sum_{\alpha,\beta} \frac{\partial q}{\partial \alpha} \iint \left[ \frac{\partial x_0}{\partial \beta} G_{2xjkt}(jk) + \frac{\partial y_0}{\partial \beta} G_{2yjkt}(jk) \right] dt^2$$

$$+ 2 \left( 3 \mu^2 L_0^{-4} \frac{\partial q}{\partial \omega_0} \right) \iiint \left[ \frac{\partial x_0}{\partial \omega_0} G_{2xjkt}(jk) + \frac{\partial y_0}{\partial \omega_0} G_{2yjkt}(jk) \right] dt^3 ,$$

where $q = x, y,$ and

$$\delta z_{2jk}(jk) = q_2 \int q_1 G_{2zjk}(jk)\, dt - q_1 \int q_2 G_{2zjk}(jk)\, dt$$

$$- q_2 \iint q_1 G_{2zjkt}(jk)\, dt^2 + q_1 \iint q_2 G_{2zjkt}(jk)\, dt^2 . \qquad (24)$$

Through the multiplication-of-series approach or the double-harmonic-analysis technique, we can develop the Fourier representations of all the integrands appearing in the above equations and then evaluate the Fourier representations of $\delta q_{2jk}(jk)$ for $q = x, y, z$. We note again that the constant terms in the various harmonic representations of the above integrands will give rise to mixed terms with coefficients t and $t^2$ in the expressions for $\delta q_{2jk}(jk)$, for $q = x, y, z$. Mixed terms with coefficient $t^3$ will also appear in the cases for $q = x, y$ because of the presence of triple integrals. These various mixed terms appearing in $\delta q_{2jk}(jk)$ will be included in the perturbations $\delta q_{2kt}(k)$, $\delta q_{2ktt}(k)$, and $\delta q_{2kttt}(k)$ for $q = x, y, z$.

The equations defining $\delta q_{2jkt}(jk)$ will be given by

$$\delta q_{2jkt}(jk) = \sum_{\alpha,\beta} \frac{\partial q}{\partial a} \int \left[ \frac{\partial x_0}{\partial \beta} G_{2xjkt}(jk) + \frac{\partial y_0}{\partial \beta} G_{2yjkt}(jk) \right] dt$$

$$- 3 \mu^2 L_0^{-4} \frac{\partial q}{\partial \omega_0} \iint \left[ \frac{\partial x_0}{\partial \omega_0} G_{2xjkt}(jk) + \frac{\partial y_0}{\partial \omega_0} G_{2yjkt}(jk) \right] dt^2 ,$$

where $q = x, y$, and

$$\delta z_{2jkt}(jk) = q_2 \int q_1 G_{2zjkt}(jk)\, dt - q_1 \int q_2 G_{2zjkt}(jk)\, dt . \qquad (25)$$

Again, through the double-harmonic-analysis technique or the multiplication-of-series approach, we can get the harmonic representations of $\delta q_{2jkt}(jk)$ for $q = x, y, z$. Also, we expect mixed terms with coefficient $t$ in $\delta q_{2jkt}(jk)$ for $q = x, y, z$ and with coefficient $t^2$ in the case of $q = x, y$. Since $\delta q_{2jkt}(jk)$ is already multiplied by $t$, these mixed terms will have coefficients $t^2$ and $t^3$. As before, these mixed terms will be included in the perturbations $\delta q_{2ktt}(k)$, $\delta q_{2kttt}(k)$.

Finally, for the evaluation of $\delta q_{2kt}(k)$, $\delta q_{2ktt}(k)$, $\delta q_{2kttt}(k)$ for $q = x, y, z$ and $\delta q_{2ktttt}(k)$ for $q = x, y$, we must recall the following relations:

$$\int t^2 f\, dt = t^2 \int f\, dt - 2t \iint f\, dt^2 + 2 \iiint f\, dt^3 ,$$

$$\iint t^2 f\, dt = t^2 \iint f\, dt^2 - 4t \iiint f\, dt^3 + 6 \iiiint f\, dt^4 , \qquad (26)$$

where $f$ is any function of time $t$.

We mentioned earlier the contributions to $\delta q_{2kt}(k)$, $\delta q_{2ktt}(k)$, $\delta q_{2ktttt}(k)$ obtained while we were deriving expressions for $\delta q_{2mjk}(mjk)$, $\delta q_{2jk}(jk)$, $\delta q_{2jkt}(jk)$. In addition to these contributions, we have the following:

$$\delta q_{2kt}(k) = -2 \sum_{\alpha,\beta} \frac{\partial q}{\partial a} \iint \left[ \frac{\partial x_0}{\partial \beta} G_{2xktt}(k) + \frac{\partial y_0}{\partial \beta} G_{2yktt}(k) \right] dt^2$$

$$+ 4 \left( 3 \mu^2 L_0^{-4} \frac{\partial q}{\partial \omega_0} \right) \iiint \left[ \frac{\partial x_0}{\partial \omega_0} G_{2xktt}(k) + \frac{\partial y_0}{\partial \omega_0} G_{2yktt} \right] dt^3 ,$$

where $q = x, y$;

$$\delta z_{2kt}(k) = -2 q_2 \iint q_1 G_{2zktt}(k) \, dt^2 + 2 q_1 \iint q_2 G_{2zktt}(k) \, dt^2 , \qquad (27)$$

$$\delta q_{2ktt}(k) = \sum_{\alpha,\beta} \frac{\partial q}{\partial a} \int \left[ \frac{\partial x_0}{\partial \beta} G_{2xktt}(k) + \frac{\partial y_0}{\partial \beta} G_{2yktt}(k) \right] dt$$

$$- 3 \mu^2 L_0^{-4} \frac{\partial q}{\partial \omega_0} \iint \left[ \frac{\partial x_0}{\partial \omega_0} G_{2xktt}(k) + \frac{\partial y_0}{\partial \omega_0} G_{2yktt}(k) \right] dt^2 ,$$

where $q = x, y$; and

$$\delta z_{2ktt}(k) = q_2 \int q_1 G_{2zktt}(k) \, dt - q_1 \int q_2 G_{2zktt}(k) \, dt . \qquad (28)$$

We note that mixed terms with coefficients $t^3$ and $t^4$ will appear from the expressions of $\delta q_{2kt}(k)$, $\delta q_{2ktt}(k)$ given in equations (27) and (28). These terms can be added to those defining $\delta q_{2kttt}(k)$, $\delta q_{2ktttt}(k)$. Terms that are purely periodic and are expressed in Fourier series in one argument $\ell_k$ will appear and are given by $\delta q_{2k}(k)$, where

$$\delta q_{2k}(k) = 2 \sum \frac{\partial q}{\partial a} \iiint \left[ \frac{\partial x_0}{\partial \beta} G_{2xktt}(k) + \frac{\partial y_0}{\partial \beta} G_{2yktt}(k) \right] dt^3$$

$$- 6 \left( 3 \mu^2 L_0^{-4} \frac{\partial q}{\partial \omega_0} \right) \iiint\iint \left[ \frac{\partial x_0}{\partial \omega_0} G_{2xktt}(k) + \frac{\partial y_0}{\partial \omega_0} G_{2yktt}(k) \right] dt^4 ,$$

for $q = x, y$, and

$$\delta z_{2k}(k) = 2 q_2 \iiint q_1 G_{2zktt}(k)\, dt^3 - 2 q_1 \iiint q_2 G_{2zktt}(k)\, dt^3 . \qquad (29)$$

Again, the terms may give rise to mixed terms with coefficients $t^3$ and $t^4$. These will be added to $\delta q_{2kttt}(k)$ for $q = x, y, z$ and to $\delta q_{2ktttt}(k)$ for $q = x, y$.

A computer program THEORY 2 has been constructed to compute $\delta q_{2jk}(jk)$, $\delta q_{2jkt}(jk)$, $\delta q_{2k}(k)$, $\delta q_{2kt}(k)$, ..., $\delta q_{2ktttt}(k)$. The input of this program is j, k. The final output is the Fourier representations of these perturbations. In this program, we followed the double- and single-harmonic-analysis methods; we did not apply the multiplication-of-series technique.

## 5. NUMERICAL APPLICATION

In the previous section, we outlined the method followed for computing the second-order perturbations in $\delta x$, $\delta y$, and $\delta z$. We have two main computer programs. By use of the harmonic-analysis approach, program THEORY 2 computes the periodic and secular perturbations expressed in Fourier series in the two mean anomalies $\ell_j$, $\ell_k$ of the disturbing and the disturbed planets and also in one mean anomaly $\ell_k$ of the disturbed planet.

The second main program computes the periodic perturbations expressed in Fourier series in the three mean anomalies: $\ell_m$, $\ell_j$, the mean anomalies of the disturbing planets, and $\ell_k$, the mean anomaly of the disturbed planet.

We used the multiplication-of-series approach, which required carrying the multiplication to a certain tolerance. This tolerance is taken to be directly proportional to the divisor when we compute the integrand that will be integrated once. For the case of the integrand that will be integrated twice, we take the tolerance to be directly proportional to the square of the divisor (the constant of proportionality is $10^{-13}$). This variable tolerance device will assure us that there has been no loss of any significant digits owing to the small divisor.

The author will soon publish the details of these two main programs and the different subroutines associated with them.

## 6. NUMERICAL RESULTS

In this section, we present the results of the computation of the second-order perturbation of Mars containing the masses of Jupiter and Saturn; according to the notation given previously, we give the results of $\delta q_{2mjk}$ ($q = x, y, z$), where $m = 6$, $j = 5$, and $k = 4$. The other results will be given in another paper.

Tables 1, 2, and 3 give the periodic part of the Fourier series representation of $\delta x_{2mjk}$, $\delta y_{2mjk}$, and $\delta z_{2mjk}$. The mixed terms arising from the evaluation of these perturbations are given in Tables 4, 5, and 6. The coefficients in these mixed terms are computed up to a tolerance of $10^{-19}$. As a check, it would be interesting to compare the series we obtained for these perturbations with the results obtained from numerical integration.

The above series representations (periodic and mixed) are simply the analytical solution of the set of differential equations (2), where $G_{2x}$, $G_{2y}$, and $G_{2z}$ are replaced by $G_{2xmjk}$, $G_{2ymjk}$, and $G_{2zmjk}$. That set of differential equations has been solved numerically, using Cowell's method of numerical integration. In applying this method, the tenth difference has been neglected and the interval of integrations is taken to be 10 days. The initial values of the numerical integration are chosen such that $\delta x$, $\delta y$, $\delta z$ at $t = 90$ days and $t = 100$ days are given by the analytical solutions of $\delta x$, $\delta y$, $\delta z$.

The evaluation of $G_{2xmjk}$, $G_{2ymjk}$, $G_{2zmjk}$ in the numerical integration of the differential equation was carried out by use of the original definition of these G's as given by equations (17). The integration has been carried out up to $t = 40,000$ days.

When we compare the results of the numerical integration with the analytical representation, deviation is found between the two. The deviations found in the comparison of the perturbations in x and y are periodic in character, with the amplitude increasing with time. The amplitude reaches $5 \times 10^{-7}$ around t = 20,000. The deviation found in the comparison of the perturbation in z is again periodic, with smaller amplitude. The amplitude reaches $1 \times 10^{-9}$. The disagreement between the numerical solution and the analytical representation of the perturbation in x, y is very alarming.

However, we must expect a satisfactory agreement if the starting values used in initiating the numerical integration are given to a great accuracy. These starting values have been obtained, as mentioned earlier, from the analytical solution. In obtaining the analytical solution, we carried the evaluation of the different integrals involved up to a tolerance of $10^{-13}$; i.e., terms with absolute values less than $10^{-13}$ have been neglected. These terms may add up, causing the accuracy of the evaluation of the integral to be more than $10^{-13}$. We must remember, also, that these integrals must be multiplied by the partial derivatives $\partial x_0/\partial \omega_0$, $\partial y_0/\partial \omega_0$, $\partial x_0/\partial L_0$, $\partial y_0/\partial L_0$, .... The coefficients of the harmonic representation of these partial derivatives amount to $10^2$. Thus, the accuracy of the evaluation of the periodic representation of the perturbation in x, y, and z may amount to $10^{-11}$ or even $10^{-10}$.

Numerical integration of the differential equations defining the second-order perturbation is very sensitive to the starting values, which we have just found may be in error to within $10^{-10}$ to $10^{-11}$. To meet that situation,* we can apply differential corrections to the starting values, such that the deviation between the numerical integration and the analytical solution is minimum, in the least-squares sense.

*The author owes this idea to Prof. G. M. Clemence.

We have applied differential corrections where our equation of condition corresponded to deviations at t = 200, 1800, 3400, . . . , 19,400 days. The results of this follow:

At $t = 90$ days,

$$\Delta(\delta x) = -8.6198240974 \times 10^{-11}$$

$$\Delta(\delta y) = -1.3774726475 \times 10^{-10}$$

$$\Delta(\delta z) = +3.2748239038 \times 10^{-10} \quad .$$

At $t = 100$ days,

$$\Delta(\delta x) = -3.6212757640 \times 10^{-11}$$

$$\Delta(\delta y) = -2.4084833490 \times 10^{-10}$$

$$\Delta(\delta z) = +3.5234609123 \times 10^{-10} \quad .$$

When we apply these corrections to the starting values of the numerical integration, the agreement between the analytical solution and the numerical integration improves appreciably. The deviation, after the integration is carried to 40,000 days, never exceeds $4 \times 10^{-10}$ in x, y and $1 \times 10^{-9}$ in z, an excellent agreement indeed. This comparison is shown in Table 7.

Table 1. Fourier representation of $\delta x_{2mjk}$ (periodic part). The coefficients are in units of $10^{-13}$

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1083 | 0 | 3 | -7 | 1 | 9629 | -25492 | 5 | 10 | -9 | -33 | 25 | 10 | -7 | 3 | 1228 | 683 |
| 0 | 0 | 1 | -4250 | 72 | 3 | -7 | 2 | -54563 | 18508 | 5 | 10 | -8 | -12 | 9 | 10 | -7 | 4 | 121 | 131 |
| 0 | 0 | 2 | -594 | 0 | 3 | -7 | 3 | -4969 | 13468 | 5 | 10 | -7 | -9 | 3 | 10 | -7 | 5 | -3 | 17 |
| 0 | 0 | 3 | -62 | -5 | 3 | -7 | 4 | -353 | 4738 | 5 | 10 | -6 | -4 | -11 | 10 | -7 | 6 | -10 | 9 |
| 0 | 0 | 4 | -15 | -0 | 3 | -7 | 5 | -430 | 19 | 5 | 10 | -5 | -1 | -1 | 10 | -7 | 7 | -2 | 2 |
| 0 | 0 | 5 | 3 | 1 | 3 | -7 | 6 | -173 | -185 | 5 | 11 | -15 | 3 | 0 | 10 | -6 | -4 | -2 | 4 |
| 0 | 0 | 6 | 2 | -0 | 3 | -7 | 7 | -32 | -32 | 5 | 11 | -14 | 9 | 6 | 10 | -6 | -3 | 3 | 7 |
| 0 | 1 | -9 | 6 | -6 | 3 | -7 | 8 | 15 | 6 | 5 | 11 | -13 | 7 | 10 | 10 | -6 | -2 | 24 | -46 |
| 0 | 1 | -8 | 7 | -8 | 3 | -7 | 9 | -19 | -21 | 5 | 11 | -12 | -17 | -8 | 10 | -6 | -1 | 407 | -418 |
| 0 | 1 | -7 | -35 | 34 | 3 | -7 | 10 | -4 | -4 | 5 | 11 | -11 | -5 | -15 | 10 | -6 | 0 | 7219 | -7464 |
| 0 | 1 | -6 | -111 | 119 | 3 | -6 | -4 | 9 | -2 | 5 | 11 | -10 | 9 | -11 | 10 | -6 | 1 | 3101 | -4965 |
| 0 | 1 | -5 | -316 | 446 | 3 | -6 | -3 | 85 | -20 | 5 | 11 | -9 | 8 | 6 | 10 | -6 | 2 | -3208 | 3247 |
| 0 | 1 | -4 | -2580 | 3498 | 3 | -6 | -2 | 791 | -176 | 5 | 11 | -8 | -1 | 3 | 10 | -6 | 3 | -1015 | 1345 |
| 0 | 1 | -3 | -16560 | 22995 | 3 | -6 | -1 | 7946 | -1741 | 5 | 11 | 7 | -6 | -20 | 10 | -6 | 4 | -149 | 204 |
| 0 | 1 | -2 | -57024 | 84409 | 3 | -6 | 0 | 97084 | -21127 | 5 | 11 | 8 | 22 | -13 | 10 | -6 | 5 | -20 | 43 |
| 0 | 1 | -1 | 36952 | -55096 | 3 | -6 | 1 | 66106 | -46259 | 5 | 11 | 9 | 11 | 1 | 10 | -6 | 6 | -2 | 6 |
| 0 | 1 | 0 | 148599 | -220970 | 3 | -6 | 2 | -42090 | 20991 | 5 | 11 | 10 | 13 | -15 | 10 | -5 | -5 | -2 | 4 |
| 0 | 1 | 1 | 20255 | -22477 | 3 | -6 | 3 | -10423 | 21752 | 5 | 11 | 11 | 15 | 10 | 10 | -5 | -4 | -12 | -0 |
| 0 | 1 | 2 | 1898 | -1820 | 3 | -6 | 4 | -6411 | 1214 | 5 | 12 | -14 | 4 | 2 | 10 | -5 | -3 | -37 | 44 |
| 0 | 1 | 3 | 227 | -215 | 3 | -6 | 5 | -2194 | -492 | 5 | 12 | -13 | -1 | 4 | 10 | -5 | -2 | -230 | 442 |
| 0 | 1 | 4 | 40 | -43 | 3 | -6 | 6 | -407 | -108 | 5 | 12 | -12 | -8 | -3 | 10 | -5 | -1 | -2172 | 3982 |
| 0 | 1 | 5 | 4 | 8 | 3 | -6 | 7 | -68 | -45 | 5 | 12 | -11 | 0 | -5 | 10 | -5 | 0 | 400 | 4865 |
| 0 | 1 | 6 | 1 | 1 | 3 | -6 | 8 | -9 | -2 | 5 | 12 | -10 | 5 | 0 | 10 | -5 | 1 | 2582 | -4306 |
| 0 | 2 | -10 | -2 | 3 | 3 | -6 | 9 | -1 | -1 | 5 | 12 | -9 | 1 | 1 | 10 | -5 | 2 | 121 | -2324 |
| 0 | 2 | -9 | -3 | -0 | 3 | -6 | 11 | -1 | -0 | 5 | 12 | -8 | -1 | 1 | 10 | -5 | 3 | -10 | -279 |
| 0 | 2 | -8 | -17 | -46 | 3 | -5 | -5 | 2 | -0 | 6 | -15 | -1 | -1 | -1 | 10 | -5 | 4 | 1 | -37 |
| 0 | 2 | -7 | 74 | -29 | 3 | -5 | -4 | 24 | -9 | 6 | -15 | 0 | -11 | -6 | 10 | -5 | 5 | -0 | -7 |
| 0 | 2 | -6 | -21 | -25 | 3 | -5 | -3 | 241 | -48 | 6 | -15 | 1 | -118 | -60 | 10 | -4 | -6 | 1 | 3 |
| 0 | 2 | -5 | 124 | 26 | 3 | -5 | -2 | 2211 | -413 | 6 | -15 | 3 | 118 | 60 | 10 | -4 | -5 | 9 | 22 |
| 0 | 2 | -4 | -439 | -216 | 3 | -5 | -1 | 22708 | -4298 | 6 | -15 | 4 | 11 | 6 | 10 | -4 | -4 | 36 | 196 |
| 0 | 2 | -3 | -4371 | -7328 | 3 | -5 | 0 | 295471 | -51998 | 6 | -15 | 5 | 1 | 1 | 10 | -4 | -3 | 286 | 1536 |
| 0 | 2 | -2 | -2362 | -27522 | 3 | -5 | 1 | 283632 | -71833 | 6 | -14 | 2 | 0 | 1 | 10 | -4 | -2 | 1856 | 10678 |
| 0 | 2 | -1 | 4872 | 23881 | 3 | -5 | 2 | -87364 | 13848 | 6 | -14 | 4 | -0 | -1 | 10 | -4 | -1 | -6539 | -12042 |
| 0 | 2 | 0 | 11738 | 43557 | 3 | -5 | 3 | -86367 | 19581 | 6 | -14 | 5 | 1 | 1 | 10 | -4 | 0 | -8415 | -36594 |
| 0 | 2 | 1 | 1200 | 5853 | 3 | -5 | 4 | -23201 | 4971 | 6 | -14 | 6 | -2 | 1 | 10 | -4 | 1 | 6092 | 10279 |
| 0 | 2 | 2 | 101 | 558 | 3 | -5 | 5 | -3732 | 846 | 6 | -14 | 7 | -1 | -1 | 10 | -4 | 2 | 919 | 1363 |
| 0 | 2 | 3 | 13 | 106 | 3 | -5 | 6 | -495 | 123 | 6 | -14 | 8 | 2 | -1 | 10 | -4 | 3 | 107 | 149 |
| 0 | 2 | 4 | -6 | 46 | 3 | -5 | 7 | -42 | -3 | 6 | -13 | 3 | 4 | -2 | 10 | -4 | 4 | 8 | 14 |
| 0 | 2 | 5 | -0 | -7 | 3 | -5 | 8 | -20 | 9 | 6 | -13 | 4 | 7 | 5 | 10 | -3 | -6 | -1 | -2 |
| 0 | 2 | 6 | 0 | 1 | 3 | -5 | 9 | -3 | 1 | 6 | -13 | 5 | -6 | -2 | 10 | -3 | -5 | 8 | 2 |
| 0 | 3 | -7 | 5 | 2 | 3 | -4 | -6 | -1 | 0 | 6 | -13 | 6 | -10 | -4 | 10 | -3 | -4 | 43 | 45 |
| 0 | 3 | -6 | -7 | -28 | 3 | -4 | -5 | 6 | -9 | 6 | -13 | 7 | 2 | -1 | 10 | -3 | -3 | 279 | 55 |
| 0 | 3 | -5 | 2 | -8 | 3 | -4 | -4 | 32 | -52 | 6 | -13 | 8 | 7 | 4 | 10 | -3 | -2 | 1974 | 191 |
| 0 | 3 | -4 | 165 | -77 | 3 | -4 | -3 | 304 | -451 | 6 | -13 | 9 | -2 | 3 | 10 | -3 | -1 | 25 | -569 |
| 0 | 3 | -3 | 2033 | 854 | 3 | -4 | -2 | 2791 | -4171 | 6 | -12 | 0 | 2 | 3 | 10 | -3 | 0 | -5110 | -738 |
| 0 | 3 | -2 | 5154 | 2865 | 3 | -4 | -1 | 29703 | -42993 | 6 | -12 | 1 | -8 | -6 | 10 | -3 | 1 | -363 | 373 |
| 0 | 3 | -1 | -7583 | -3962 | 3 | -4 | 0 | 413969 | -492148 | 6 | -12 | 2 | -18 | -4 | 10 | -3 | 2 | -28 | 41 |
| 0 | 3 | 0 | -7025 | -124 | 3 | -4 | 1 | 493960 | -558567 | 6 | -12 | 3 | 17 | 20 | 10 | -3 | 3 | -5 | 1 |
| 0 | 3 | 1 | -554 | 155 | 3 | -4 | 2 | -205729 | 240869 | 6 | -12 | 4 | 12 | 11 | 10 | -3 | 4 | -1 | -3 |
| 0 | 3 | 2 | -80 | 3 | 3 | -4 | 3 | -129329 | 150349 | 6 | -12 | 5 | 12 | 0 | 10 | -3 | 5 | -0 | -2 |
| 0 | 3 | 3 | -2 | -4 | 3 | -4 | 4 | -19555 | 23284 | 6 | -12 | 6 | -3 | 8 | 10 | -2 | -10 | 0 | -2 |
| 0 | 3 | 4 | -5 | 16 | 3 | -4 | 5 | -2532 | 3063 | 6 | -12 | 7 | -6 | 2 | 10 | -2 | -9 | 3 | -2 |
| 0 | 3 | 5 | 3 | -5 | 3 | -4 | 6 | -313 | 396 | 6 | -12 | 8 | 0 | -5 | 10 | -2 | -8 | 4 | -35 |
| 0 | 3 | 6 | 3 | -6 | 3 | -4 | 7 | -17 | 26 | 6 | -12 | 9 | -5 | -0 | 10 | -2 | -7 | -24 | 17 |
| 0 | 4 | -8 | -3 | -3 | 3 | -4 | 8 | -4 | 8 | 6 | -11 | -1 | -1 | 1 | 10 | -2 | -6 | -0 | -20 |
| 0 | 4 | -7 | -18 | -16 | 3 | -3 | -7 | 2 | 1 | 6 | -11 | 0 | -9 | 2 | 10 | -2 | -5 | 31 | 117 |
| 0 | 4 | -6 | 10 | 5 | 3 | -3 | -6 | 10 | 3 | 6 | -11 | 1 | -3 | -46 | 10 | -2 | -4 | -462 | 442 |
| 0 | 4 | -5 | 36 | 45 | 3 | -3 | -5 | 30 | -11 | 6 | -11 | 2 | -31 | 20 | 10 | -2 | -3 | -2742 | -1310 |
| 0 | 4 | -4 | 137 | 50 | 3 | -3 | -4 | 34 | -113 | 6 | -11 | 3 | -46 | -24 | 10 | -2 | -2 | -125 | -3028 |
| 0 | 4 | -3 | 644 | 946 | 3 | -3 | -3 | 399 | -941 | 6 | -11 | 4 | 14 | -69 | 10 | -2 | -1 | 3840 | 2931 |
| 0 | 4 | -2 | -518 | 1304 | 3 | -3 | -2 | 3451 | -7506 | 6 | -11 | 5 | 16 | 47 | 10 | -2 | 0 | 7261 | 2481 |
| 0 | 4 | -1 | 50 | -2471 | 3 | -3 | -1 | 25275 | -53316 | 6 | -11 | 6 | -0 | 21 | 10 | -2 | 1 | 557 | 215 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 4 | 0 | -760 | -1341 | 3 | -3 | 0 | -46154 | 574408 | 6 | -11 | 7 | -6 | -23 | 10 | -2 | 2 | 51 | 14 |
| 0 | 4 | 1 | -61 | -91 | 3 | -3 | 1 | -54122 | 164016 | 6 | -11 | 8 | 15 | 12 | 10 | -2 | 3 | 3 | -5 |
| 0 | 4 | 2 | -8 | -4 | 3 | -3 | 2 | 15411 | -243037 | 6 | -11 | 9 | -10 | 5 | 10 | -2 | 4 | -0 | -1 |
| 0 | 4 | 3 | -0 | 2 | 3 | -3 | 3 | 5267 | -39758 | 6 | -10 | -3 | 1 | -0 | 10 | -1 | -7 | 2 | 11 |
| 0 | 4 | 4 | 0 | -2 | 3 | -3 | 4 | 832 | -5211 | 6 | -10 | -2 | 1 | -0 | 10 | -1 | -6 | -16 | 17 |
| 0 | 5 | -8 | -3 | 1 | 3 | -3 | 5 | 137 | -670 | 6 | -10 | -1 | -27 | 11 | 10 | -1 | -5 | 7 | -4 |
| 0 | 5 | -7 | -41 | 1 | 3 | -3 | 6 | 19 | -85 | 6 | -10 | 0 | -275 | 73 | 10 | -1 | -4 | -45 | 85 |
| 0 | 5 | -6 | 13 | 21 | 3 | -3 | 7 | -22 | -23 | 6 | -10 | 1 | 366 | -709 | 10 | -1 | -3 | -427 | 9 |
| 0 | 5 | -5 | 37 | -14 | 3 | -3 | 8 | 7 | -1 | 6 | -10 | 2 | -43 | -127 | 10 | -1 | -2 | -584 | -540 |
| 0 | 5 | -4 | 201 | -33 | 3 | -3 | 9 | 4 | 2 | 6 | -10 | 3 | -170 | 81 | 10 | -1 | -1 | 1485 | 101 |
| 0 | 5 | -3 | -218 | 349 | 3 | -2 | -8 | 2 | -5 | 6 | -10 | 4 | 121 | 50 | 10 | -1 | 0 | 1623 | -557 |
| 0 | 5 | -2 | -264 | 121 | 3 | -2 | -7 | -2 | 4 | 6 | -10 | 5 | 20 | 55 | 10 | -1 | 1 | 138 | -47 |
| 0 | 5 | -1 | 480 | -322 | 3 | -2 | -6 | -4 | 1 | 6 | -10 | 6 | -13 | 41 | 10 | -1 | 2 | 12 | -3 |
| 0 | 5 | 0 | 59 | -378 | 3 | -2 | -5 | -74 | -97 | 6 | -10 | 7 | 9 | -35 | 10 | -1 | 3 | -4 | 3 |
| 0 | 5 | 1 | 5 | -31 | 3 | -2 | -4 | -650 | -781 | 6 | -10 | 8 | 1 | -14 | 10 | 0 | -7 | 1 | 3 |
| 0 | 5 | 2 | 1 | -3 | 3 | -2 | -3 | -4819 | -6027 | 6 | -10 | 9 | -2 | 4 | 10 | 0 | -6 | 4 | 40 |
| 0 | 6 | -9 | -5 | 2 | 3 | -2 | -2 | -42524 | -56643 | 6 | -9 | -4 | -7 | 2 | 10 | 0 | -5 | -3 | -17 |
| 0 | 6 | -8 | -26 | 16 | 3 | -2 | -1 | -390699 | -635414 | 6 | -9 | -3 | -57 | 17 | 10 | 0 | -4 | -21 | -8 |
| 0 | 6 | -7 | -53 | 40 | 3 | -2 | 0 | 1287099 | -227997 | 6 | -9 | -2 | -517 | 156 | 10 | 0 | -3 | -141 | -210 |
| 0 | 6 | -6 | 49 | -50 | 3 | -2 | 1 | 832086 | 636959 | 6 | -9 | -1 | -4883 | 1454 | 10 | 0 | -2 | 2 | -105 |
| 0 | 6 | -5 | 95 | -40 | 3 | -2 | 2 | -421538 | 138033 | 6 | -9 | 0 | -50886 | 15060 | 10 | 0 | -1 | 194 | 188 |
| 0 | 6 | -4 | 21 | 69 | 3 | -2 | 3 | -111319 | 29091 | 6 | -9 | 1 | 21134 | -17116 | 10 | 0 | 0 | 285 | -40 |
| 0 | 6 | -3 | -164 | 17 | 3 | -2 | 4 | -16814 | 4192 | 6 | -9 | 2 | 53963 | -17513 | 10 | 0 | 1 | 23 | -2 |
| 0 | 6 | -2 | -123 | 315 | 3 | -2 | 5 | -2277 | 545 | 6 | -9 | 3 | -2047 | 4325 | 10 | 0 | 2 | 0 | 3 |
| 0 | 6 | -1 | 221 | 81 | 3 | -2 | 6 | -290 | 27 | 6 | -9 | 4 | -305 | 850 | 10 | 1 | -7 | 14 | 14 |
| 0 | 6 | 0 | 137 | -369 | 3 | -2 | 7 | -52 | 19 | 6 | -9 | 5 | -41 | 141 | 10 | 1 | -6 | 43 | 43 |
| 0 | 6 | 1 | 17 | -31 | 3 | -2 | 8 | 28 | 27 | 6 | -9 | 6 | -39 | 15 | 10 | 1 | -5 | -18 | 13 |
| 0 | 6 | 2 | 2 | -3 | 3 | -2 | 9 | 10 | 7 | 6 | -9 | 7 | -7 | -67 | 10 | 1 | -4 | -49 | -37 |
| 0 | 7 | -9 | 2 | -5 | 3 | -2 | 10 | -7 | -4 | 6 | -9 | 8 | 2 | 3 | 10 | 1 | -3 | 2 | -71 |
| 0 | 7 | -8 | -8 | 23 | 3 | -1 | -9 | 2 | -0 | 6 | -9 | 9 | 0 | 1 | 10 | 1 | -2 | -5 | -7 |
| 0 | 7 | -7 | -20 | -5 | 3 | -1 | -8 | 0 | -3 | 6 | -8 | -4 | -4 | 0 | 10 | 1 | -1 | 10 | 57 |
| 0 | 7 | -6 | 14 | -29 | 3 | -1 | -7 | -3 | -18 | 6 | -8 | -3 | -44 | 4 | 10 | 1 | 0 | 69 | -4 |
| 0 | 7 | -5 | 32 | 15 | 3 | -1 | -6 | -39 | -39 | 6 | -8 | -2 | -397 | 30 | 10 | 1 | 1 | 2 | -3 |
| 0 | 7 | -4 | -4 | -7 | 3 | -1 | -5 | -791 | -400 | 6 | -8 | -1 | -3858 | 209 | 10 | 1 | 2 | -3 | 1 |
| 0 | 7 | -3 | -21 | 44 | 3 | -1 | -4 | -6181 | -2974 | 6 | -8 | 0 | -44608 | 2031 | 10 | 2 | -8 | -4 | -1 |
| 0 | 7 | -2 | 38 | 37 | 3 | -1 | -3 | -48638 | -22491 | 6 | -8 | 1 | -44551 | 10624 | 10 | 2 | -7 | 23 | 1 |
| 0 | 7 | -1 | 4 | -19 | 3 | -1 | -2 | -330921 | -137713 | 6 | -8 | 2 | 37894 | -2903 | 10 | 2 | -6 | 9 | 17 |
| 0 | 7 | 0 | -8 | -19 | 3 | -1 | -1 | 94566 | 179297 | 6 | -8 | 3 | 17201 | -3018 | 10 | 2 | -5 | -22 | 1 |
| 0 | 7 | 1 | -2 | -2 | 3 | -1 | 0 | 1003760 | 457871 | 6 | -8 | 4 | 2239 | -190 | 10 | 2 | -4 | -20 | -12 |
| 0 | 8 | -9 | -4 | -10 | 3 | -1 | 1 | -27505 | -133646 | 6 | -8 | 5 | 296 | -15 | 10 | 2 | -3 | 5 | 15 |
| 0 | 8 | -8 | 10 | 2 | 3 | -1 | 2 | -8945 | -16213 | 6 | -8 | 6 | 33 | -8 | 10 | 2 | -2 | -45 | 5 |
| 0 | 8 | -7 | 0 | 15 | 3 | -1 | 3 | -1166 | -1829 | 6 | -8 | 7 | -23 | -25 | 10 | 2 | -1 | -7 | 11 |
| 0 | 8 | -6 | -4 | -10 | 3 | -1 | 4 | -171 | -213 | 6 | -8 | 8 | -6 | -6 | 10 | 2 | 0 | 73 | 8 |
| 0 | 8 | -5 | -10 | -23 | 3 | -1 | 5 | -13 | -22 | 6 | -7 | -3 | 0 | -20 | 10 | 2 | 1 | 6 | -0 |
| 0 | 8 | -4 | 13 | 7 | 3 | -1 | 6 | 21 | -1 | 6 | -7 | -2 | 54 | -213 | 10 | 3 | -8 | -9 | 6 |
| 0 | 8 | -3 | -1 | 3 | 3 | -1 | 7 | -0 | 5 | 6 | -7 | -1 | 554 | -2278 | 10 | 3 | -7 | 3 | -2 |
| 0 | 9 | -9 | 1 | -5 | 3 | -1 | 8 | -23 | 1 | 6 | -7 | 0 | 5558 | -30933 | 10 | 3 | -6 | 11 | -8 |
| 0 | 9 | -8 | 4 | 1 | 3 | -1 | 9 | -4 | 1 | 6 | -7 | 1 | -2058 | -32431 | 10 | 3 | -5 | 5 | 2 |
| 0 | 9 | -7 | -1 | 5 | 3 | -1 | 10 | 6 | -0 | 6 | -7 | 2 | -2150 | 21974 | 10 | 3 | -4 | -4 | 13 |
| 0 | 9 | -6 | -4 | -4 | 3 | 0 | -8 | -1 | -1 | 6 | -7 | 3 | 475 | 10736 | 10 | 3 | -3 | -3 | -1 |
| 0 | 9 | -4 | 1 | 3 | 3 | 0 | -7 | -1 | -2 | 6 | -7 | 4 | -198 | 1392 | 10 | 4 | -9 | -1 | 3 |
| 1 | -13 | 1 | 3 | -7 | 3 | 0 | -6 | -135 | 5 | 6 | -7 | 5 | -30 | 159 | 10 | 4 | -8 | -5 | 1 |
| 1 | -13 | 3 | -3 | 7 | 3 | 0 | -5 | -609 | 241 | 6 | -7 | 6 | -23 | 17 | 10 | 4 | -7 | 1 | -7 |
| 1 | -13 | 8 | 2 | -1 | 3 | 0 | -4 | -4061 | 1505 | 6 | -7 | 7 | -10 | 4 | 10 | 4 | -6 | 5 | -1 |
| 1 | -13 | 9 | 3 | 1 | 3 | 0 | -3 | -25226 | 9849 | 6 | -7 | 8 | -2 | 0 | 10 | 4 | -5 | -0 | 3 |
| 1 | -13 | 10 | -3 | 5 | 3 | 0 | -2 | -91307 | 32793 | 6 | -6 | -4 | 2 | 2 | 10 | 21 | -7 | -0 | 1 |
| 1 | -13 | 11 | -3 | -1 | 3 | 0 | -1 | 66705 | -21356 | 6 | -6 | -3 | 29 | 33 | 10 | 21 | -6 | -3 | 10 |
| 1 | -13 | 12 | 1 | -4 | 3 | 0 | 0 | 239195 | -80709 | 6 | -6 | -2 | 249 | 284 | 10 | 21 | -5 | -35 | 105 |
| 1 | -12 | 6 | -11 | -5 | 3 | 0 | 1 | 18009 | -12762 | 6 | -6 | -1 | 2467 | 2380 | 10 | 21 | -3 | 36 | -110 |
| 1 | -12 | 7 | 2 | -18 | 3 | 0 | 2 | 1480 | -1244 | 6 | -6 | 0 | 28661 | 5075 | 10 | 21 | -2 | 3 | -10 |
| 1 | -12 | 8 | 7 | 2 | 3 | 0 | 3 | 156 | -151 | 6 | -6 | 1 | 23331 | -5884 | 10 | 21 | -1 | 0 | -1 |
| 1 | -12 | 9 | -3 | -24 | 3 | 0 | 4 | 17 | -22 | 6 | -6 | 2 | -14659 | -4428 | 11 | -19 | 1 | 0 | -2 |
| 1 | -12 | 10 | -16 | 5 | 3 | 0 | 5 | -5 | 5 | 6 | -6 | 3 | -7427 | 103 | 11 | -19 | 3 | -0 | 2 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -12 | 11 | -1 | -1 | 3 | 1 | -11 | -1 | -6 | 6 | -6 | 4 | -1297 | 156 | 11 | -18 | 0 | 2 | 0 |
| 1 | -12 | 12 | 5 | -7 | 3 | 1 | -10 | -4 | 2 | 6 | -6 | 5 | -171 | 10 | 11 | -18 | 1 | 20 | 2 |
| 1 | -11 | 3 | 0 | 1 | 3 | 1 | -9 | 1 | 27 | 6 | -6 | 6 | -40 | 20 | 11 | -18 | 3 | -25 | -3 |
| 1 | -11 | 4 | 2 | 10 | 3 | 1 | -8 | 6 | 26 | 6 | -6 | 7 | -9 | 5 | 11 | -18 | 4 | -2 | -0 |
| 1 | -11 | 5 | -12 | 7 | 3 | 1 | -7 | -39 | -4 | 6 | -5 | -5 | -1 | -1 | 11 | -17 | -2 | -1 | 3 |
| 1 | -11 | 6 | -6 | -27 | 3 | 1 | -6 | -71 | 0 | 6 | -5 | -4 | -8 | -5 | 11 | -17 | -1 | -14 | 30 |
| 1 | -11 | 7 | -3 | -14 | 3 | 1 | -5 | -77 | -25 | 6 | -5 | -3 | -90 | -26 | 11 | -17 | 0 | -135 | 291 |
| 1 | -11 | 8 | -6 | -21 | 3 | 1 | -4 | 321 | -1052 | 6 | -5 | -2 | -717 | -164 | 11 | -17 | 1 | -1401 | 3097 |
| 1 | -11 | 9 | 11 | -15 | 3 | 1 | -3 | 6451 | -15385 | 6 | -5 | -1 | -5304 | -913 | 11 | -17 | 2 | 30 | 71 |
| 1 | -11 | 10 | 20 | 19 | 3 | 1 | -2 | 14289 | -42311 | 6 | -5 | 0 | -2690 | -8049 | 11 | -17 | 3 | 1390 | -3066 |
| 1 | -11 | 11 | -1 | 20 | 3 | 1 | -1 | -24110 | 54890 | 6 | -5 | 1 | 13556 | -14648 | 11 | -17 | 4 | 125 | -315 |
| 1 | -11 | 12 | 2 | -7 | 3 | 1 | 0 | -17110 | 61685 | 6 | -5 | 2 | 2502 | 3783 | 11 | -17 | 5 | 13 | -34 |
| 1 | -10 | 1 | 2 | 5 | 3 | 1 | 1 | -1137 | 4369 | 6 | -5 | 3 | -923 | 3625 | 11 | -17 | 6 | 1 | -3 |
| 1 | -10 | 2 | -0 | 5 | 3 | 1 | 2 | -82 | 388 | 6 | -5 | 4 | -188 | 575 | 11 | -16 | 1 | -1 | -7 |
| 1 | -10 | 3 | -8 | -31 | 3 | 1 | 3 | -20 | 44 | 6 | -5 | 5 | -11 | 69 | 11 | -16 | 3 | 1 | 7 |
| 1 | -10 | 4 | 4 | -16 | 3 | 1 | 4 | -23 | 2 | 6 | -5 | 6 | -1 | 15 | 11 | -15 | 0 | 2 | -2 |
| 1 | -10 | 5 | 8 | 19 | 3 | 1 | 5 | 9 | -6 | 6 | -5 | 7 | -1 | 3 | 11 | -15 | 1 | 23 | -23 |
| 1 | -10 | 6 | -13 | 23 | 3 | 1 | 6 | 2 | 4 | 6 | -4 | -6 | 1 | 1 | 11 | -15 | 3 | -15 | 16 |
| 1 | -10 | 7 | -34 | -30 | 3 | 1 | 7 | -1 | 9 | 6 | -4 | -5 | 3 | 4 | 11 | -15 | 4 | -2 | 2 |
| 1 | -10 | 8 | -1 | -48 | 3 | 2 | -11 | 8 | 10 | 6 | -4 | -4 | -7 | -22 | 11 | -14 | 0 | 4 | -5 |
| 1 | -10 | 9 | -3 | 2 | 3 | 2 | -10 | 8 | 3 | 6 | -4 | -3 | 148 | -202 | 11 | -14 | 1 | 75 | -68 |
| 1 | -10 | 10 | 1 | 18 | 3 | 2 | -9 | -49 | -53 | 6 | -4 | -2 | 723 | -1584 | 11 | -14 | 2 | -38 | 3 |
| 1 | -10 | 11 | 6 | 19 | 3 | 2 | -8 | -3 | 21 | 6 | -4 | -1 | 2363 | -10295 | 11 | -14 | 3 | -52 | 48 |
| 1 | -10 | 12 | 1 | 2 | 3 | 2 | -7 | -39 | 12 | 6 | -4 | 0 | 1477 | 12075 | 11 | -14 | 4 | 6 | 4 |
| 1 | -9 | 0 | 1 | 2 | 3 | 2 | -6 | 34 | -59 | 6 | -4 | 1 | -2637 | 14266 | 11 | -14 | 5 | 5 | -6 |
| 1 | -9 | 2 | -5 | -4 | 3 | 2 | -5 | 227 | 131 | 6 | -4 | 2 | -1652 | -3135 | 11 | -13 | -1 | -1 | 0 |
| 1 | -9 | 3 | 4 | -10 | 3 | 2 | -4 | 467 | -960 | 6 | -4 | 3 | -189 | -438 | 11 | -13 | 0 | 8 | -10 |
| 1 | -9 | 4 | 33 | 4 | 3 | 2 | -3 | 3795 | -5228 | 6 | -4 | 4 | -71 | -65 | 11 | -13 | 1 | 397 | -243 |
| 1 | -9 | 5 | -4 | 68 | 3 | 2 | -2 | 9521 | 1633 | 6 | -4 | 5 | -9 | -6 | 11 | -13 | 2 | 24 | -76 |
| 1 | -9 | 6 | -71 | 26 | 3 | 2 | -1 | -15496 | 5979 | 6 | -4 | 6 | 0 | -1 | 11 | -13 | 3 | -179 | 96 |
| 1 | -9 | 7 | -39 | -38 | 3 | 2 | 0 | -11396 | 10465 | 6 | -3 | -6 | -2 | -1 | 11 | -13 | 4 | -20 | 36 |
| 1 | -9 | 8 | -19 | 10 | 3 | 2 | 1 | -864 | 758 | 6 | -3 | -5 | -10 | -0 | 11 | -13 | 5 | 5 | 8 |
| 1 | -9 | 9 | -32 | -7 | 3 | 2 | 2 | -104 | 64 | 6 | -3 | -4 | -8 | 26 | 11 | -12 | -2 | -1 | -3 |
| 1 | -9 | 10 | 44 | 27 | 3 | 2 | 3 | 0 | 41 | 6 | -3 | -3 | -46 | 153 | 11 | -12 | -1 | -11 | -25 |
| 1 | -9 | 11 | 1 | 1 | 3 | 2 | 4 | 4 | 0 | 6 | -3 | -2 | -1235 | 563 | 11 | -12 | 0 | -66 | -189 |
| 1 | -9 | 12 | 1 | 1 | 3 | 2 | 5 | -10 | -15 | 6 | -3 | -1 | -21096 | -15406 | 11 | -12 | 1 | 750 | 1149 |
| 1 | -8 | -1 | 1 | -2 | 3 | 2 | 6 | 2 | 3 | 6 | -3 | 0 | -4063 | -8110 | 11 | -12 | 2 | 199 | 352 |
| 1 | -8 | 0 | 9 | -11 | 3 | 2 | 7 | -1 | -2 | 6 | -3 | 1 | 22930 | 16699 | 11 | -12 | 3 | -262 | -409 |
| 1 | -8 | 1 | 31 | -16 | 3 | 3 | -11 | 1 | 1 | 6 | -3 | 2 | 2596 | 1951 | 11 | -12 | 4 | -58 | -54 |
| 1 | -8 | 2 | -31 | -23 | 3 | 3 | -10 | 2 | 5 | 6 | -3 | 3 | 277 | 207 | 11 | -12 | 5 | -11 | -3 |
| 1 | -8 | 3 | 79 | -42 | 3 | 3 | -9 | 15 | 30 | 6 | -3 | 4 | 46 | 7 | 11 | -11 | -4 | 2 | -1 |
| 1 | -8 | 4 | 149 | 152 | 3 | 3 | -8 | 17 | 39 | 6 | -3 | 5 | 5 | 3 | 11 | -11 | -3 | 15 | -3 |
| 1 | -8 | 5 | -164 | 245 | 3 | 3 | -7 | -11 | -59 | 6 | -3 | 6 | -5 | 4 | 11 | -11 | -2 | 135 | -26 |
| 1 | -8 | 6 | -213 | -3 | 3 | 3 | -6 | 52 | -6 | 6 | -2 | -7 | -4 | -5 | 11 | -11 | -1 | 1284 | -213 |
| 1 | -8 | 7 | -28 | -14 | 3 | 3 | -5 | -130 | -171 | 6 | -2 | -6 | -86 | -36 | 11 | -11 | 0 | 13695 | -1448 |
| 1 | -8 | 8 | 5 | -21 | 3 | 3 | -4 | -408 | -754 | 6 | -2 | -5 | -543 | 29 | 11 | -11 | 1 | -5235 | 2307 |
| 1 | -8 | 9 | 7 | -3 | 3 | 3 | -3 | 2389 | 822 | 6 | -2 | -4 | -4041 | 62 | 11 | -11 | 2 | -14802 | 1675 |
| 1 | -8 | 10 | 27 | -3 | 3 | 3 | -2 | 743 | 1351 | 6 | -2 | -3 | -31995 | 897 | 11 | -11 | 3 | 474 | -543 |
| 1 | -8 | 11 | 2 | -0 | 3 | 3 | -1 | -2727 | -1179 | 6 | -2 | -2 | -219609 | 17258 | 11 | -11 | 4 | 118 | -96 |
| 1 | -8 | 12 | 2 | -0 | 3 | 3 | 0 | -2633 | 960 | 6 | -2 | -1 | -121722 | 165037 | 11 | -11 | 5 | 15 | -15 |
| 1 | -7 | -3 | 4 | -5 | 3 | 3 | 1 | -242 | 32 | 6 | -2 | 0 | 576762 | 8744 | 11 | -11 | 6 | 2 | -1 |
| 1 | -7 | -2 | 34 | -40 | 3 | 3 | 2 | -18 | -29 | 6 | -2 | 1 | 156824 | -148883 | 11 | -10 | -3 | -2 | 3 |
| 1 | -7 | -1 | 328 | -373 | 3 | 3 | 3 | -2 | 2 | 6 | -2 | 2 | 17085 | -19032 | 11 | -10 | -2 | -17 | 25 |
| 1 | -7 | 0 | 3466 | -3883 | 3 | 3 | 4 | 0 | 7 | 6 | -2 | 3 | 1904 | -2195 | 11 | -10 | -1 | -159 | 264 |
| 1 | -7 | 1 | 1764 | 293 | 3 | 3 | 5 | -1 | -1 | 6 | -2 | 4 | 217 | -254 | 11 | -10 | 0 | -584 | 2426 |
| 1 | -7 | 2 | -3513 | 3743 | 3 | 4 | -10 | -4 | -2 | 6 | -2 | 5 | 22 | -32 | 11 | -10 | 1 | 336 | 1201 |
| 1 | -7 | 3 | -178 | 291 | 3 | 4 | -9 | 22 | 4 | 6 | -2 | 6 | 3 | -4 | 11 | -10 | 2 | 508 | -2060 |
| 1 | -7 | 4 | 119 | 1118 | 3 | 4 | -8 | 6 | -5 | 6 | -1 | -8 | -1 | -3 | 11 | -10 | 3 | 19 | -624 |
| 1 | -7 | 5 | -714 | 479 | 3 | 4 | -7 | 28 | 36 | 6 | -1 | -7 | -5 | 1 | 11 | -10 | 4 | 8 | -75 |
| 1 | -7 | 6 | -136 | 53 | 3 | 4 | -6 | -21 | 8 | 6 | -1 | -6 | -5 | -42 | 11 | -10 | 5 | 4 | -10 |
| 1 | -7 | 7 | -13 | -30 | 3 | 4 | -5 | -253 | -27 | 6 | -1 | -5 | 23 | 24 | 11 | -9 | -3 | 2 | -1 |
| 1 | -7 | 8 | 8 | -26 | 3 | 4 | -4 | 314 | -129 | 6 | -1 | -4 | -69 | -70 | 11 | -9 | -2 | -7 | -5 |
| 1 | -7 | 9 | 25 | -25 | 3 | 4 | -3 | 285 | 623 | 6 | -1 | -3 | 672 | -416 | 11 | -9 | -1 | -62 | -127 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -7 | 10 | 4 | -3 | 3 | 4 | -2 | 210 | 53 | 6 | -1 | -2 | 3823 | 237 | 11 | -9 | 0 | -370 | -260 |
| 1 | -7 | 11 | 4 | -4 | 3 | 4 | -1 | -207 | -548 | 6 | -1 | -1 | -3080 | 176 | 11 | -9 | 1 | -266 | 121 |
| 1 | -6 | -3 | 10 | -6 | 3 | 4 | 0 | -641 | 108 | 6 | -1 | 0 | -4620 | 1002 | 11 | -9 | 2 | 291 | 193 |
| 1 | -6 | -2 | 82 | -101 | 3 | 4 | 1 | -52 | 13 | 6 | -1 | 1 | -390 | 128 | 11 | -9 | 3 | 131 | 46 |
| 1 | -6 | -1 | 827 | -857 | 3 | 4 | 2 | -8 | 3 | 6 | -1 | 2 | -38 | 18 | 11 | -9 | 4 | 8 | 10 |
| 1 | -6 | 0 | 9372 | -9633 | 3 | 4 | 3 | -0 | -1 | 6 | -1 | 3 | -3 | -1 | 11 | -9 | 5 | 1 | 2 |
| 1 | -6 | 1 | -4706 | -6428 | 3 | 4 | 4 | -0 | 2 | 6 | 0 | -8 | -1 | -4 | 11 | -8 | -3 | 3 | -1 |
| 1 | -6 | 2 | -5790 | 6127 | 3 | 5 | -12 | 2 | -1 | 6 | 0 | -7 | 3 | -2 | 11 | -8 | -2 | -0 | -6 |
| 1 | -6 | 3 | 3877 | 5320 | 3 | 5 | -11 | 8 | -3 | 6 | 0 | -6 | 14 | 19 | 11 | -8 | -1 | 84 | -13 |
| 1 | -6 | 4 | -1257 | 3589 | 3 | 5 | -10 | -7 | 2 | 6 | 0 | -5 | -37 | -29 | 11 | -8 | 0 | 144 | -135 |
| 1 | -6 | 5 | -368 | 240 | 3 | 5 | -9 | -21 | 6 | 6 | 0 | -4 | -80 | 55 | 11 | -8 | 1 | -99 | -164 |
| 1 | -6 | 6 | 1 | -125 | 3 | 5 | -8 | 6 | -18 | 6 | 0 | -3 | -257 | -141 | 11 | -8 | 2 | -94 | 72 |
| 1 | -6 | 7 | 10 | 9 | 3 | 5 | -7 | -17 | 8 | 6 | 0 | -2 | -531 | -607 | 11 | -8 | 3 | -19 | 64 |
| 1 | -6 | 8 | 0 | -34 | 3 | 5 | -6 | -76 | 22 | 6 | 0 | -1 | 1157 | 505 | 11 | -8 | 4 | 0 | 15 |
| 1 | -6 | 9 | 4 | -22 | 3 | 5 | -5 | 17 | -67 | 6 | 0 | 0 | 1499 | 115 | 11 | -7 | -3 | -5 | 1 |
| 1 | -6 | 10 | -1 | -2 | 3 | 5 | -4 | 141 | 74 | 6 | 0 | 1 | 125 | 6 | 11 | -7 | -2 | 5 | 4 |
| 1 | -5 | -3 | 22 | -20 | 3 | 5 | -3 | 340 | 216 | 6 | 0 | 2 | 9 | -1 | 11 | -7 | -1 | -4 | 65 |
| 1 | -5 | -2 | 225 | -174 | 3 | 5 | -2 | 4913 | -437 | 6 | 0 | 3 | -8 | 0 | 11 | -7 | 0 | -35 | 48 |
| 1 | -5 | -1 | 2263 | -1632 | 3 | 5 | -1 | 281 | -511 | 6 | 1 | -8 | -4 | 3 | 11 | -7 | 1 | -21 | -155 |
| 1 | -5 | 0 | 27788 | -19771 | 3 | 5 | 0 | -5053 | 411 | 6 | 1 | -7 | -18 | -3 | 11 | -7 | 2 | 11 | -37 |
| 1 | -5 | 1 | 3927 | -32212 | 3 | 5 | 1 | -462 | 35 | 6 | 1 | -6 | 3 | 43 | 11 | -7 | 3 | 15 | 18 |
| 1 | -5 | 2 | 71 | 12979 | 3 | 5 | 2 | -48 | 3 | 6 | 1 | -5 | 5 | -8 | 11 | -7 | 4 | 1 | 2 |
| 1 | -5 | 3 | 1051 | 23276 | 3 | 5 | 3 | -5 | 1 | 6 | 1 | -4 | -13 | -40 | 11 | -6 | -4 | -1 | 1 |
| 1 | -5 | 4 | -2441 | 2288 | 3 | 6 | -11 | 1 | -1 | 6 | 1 | -3 | -64 | -214 | 11 | -6 | -3 | -4 | -4 |
| 1 | -5 | 5 | -760 | -758 | 3 | 6 | -10 | 8 | -23 | 6 | 1 | -2 | 76 | -157 | 11 | -6 | -2 | -4 | -7 |
| 1 | -5 | 6 | -106 | -204 | 3 | 6 | -9 | -0 | -20 | 6 | 1 | -1 | 88 | 281 | 11 | -6 | -1 | -78 | -35 |
| 1 | -5 | 7 | -1 | 0 | 3 | 6 | -8 | -1 | -4 | 6 | 1 | 0 | 214 | 128 | 11 | -6 | 0 | 56 | 36 |
| 1 | -5 | 8 | -14 | -18 | 3 | 6 | -7 | 3 | 51 | 6 | 1 | 1 | 19 | 21 | 11 | -6 | 1 | 96 | 62 |
| 1 | -5 | 9 | -3 | -8 | 3 | 6 | -6 | -29 | 6 | 6 | 1 | 2 | -2 | 4 | 11 | -6 | 2 | -17 | -4 |
| 1 | -5 | 10 | -1 | -1 | 3 | 6 | -5 | 33 | -7 | 6 | 1 | 3 | -2 | -2 | 11 | -6 | 3 | -1 | -3 |
| 1 | -4 | -7 | 0 | -3 | 3 | 6 | -4 | 10 | 21 | 6 | 2 | -8 | -3 | -2 | 11 | -5 | -4 | -1 | 0 |
| 1 | -4 | -6 | -3 | -4 | 3 | 6 | -3 | -6 | 5 | 6 | 2 | -7 | 21 | 4 | 11 | -5 | -3 | 5 | -1 |
| 1 | -4 | -5 | -0 | 8 | 3 | 6 | -2 | -3 | 0 | 6 | 2 | -6 | -19 | 22 | 11 | -5 | -2 | 10 | 7 |
| 1 | -4 | -4 | 4 | -21 | 3 | 6 | -1 | -25 | 6 | 6 | 2 | -5 | -30 | 21 | 11 | -5 | -1 | -134 | 89 |
| 1 | -4 | -3 | 115 | -28 | 3 | 6 | 0 | -1 | -1 | 6 | 2 | -4 | -35 | -37 | 11 | -5 | 0 | -94 | 25 |
| 1 | -4 | -2 | 1155 | -376 | 3 | 6 | 1 | 2 | 3 | 6 | 2 | -3 | 13 | -74 | 11 | -5 | 1 | 138 | -85 |
| 1 | -4 | -1 | 11853 | -4090 | 3 | 7 | -11 | 1 | 8 | 6 | 2 | -2 | 31 | 19 | 11 | -5 | 2 | 18 | -15 |
| 1 | -4 | 0 | 154173 | -53233 | 3 | 7 | -10 | -8 | -21 | 6 | 2 | -1 | -15 | 45 | 11 | -5 | 3 | 2 | -1 |
| 1 | -4 | 1 | 123451 | -109453 | 3 | 7 | -9 | 18 | 6 | 6 | 2 | 0 | 25 | 23 | 11 | -4 | -4 | -6 | 10 |
| 1 | -4 | 2 | -28104 | 72016 | 3 | 7 | -8 | -14 | 9 | 6 | 2 | 1 | -3 | -2 | 11 | -4 | -3 | -44 | 67 |
| 1 | -4 | 3 | -36334 | 29878 | 3 | 7 | -7 | -19 | -2 | 6 | 3 | -8 | -5 | -1 | 11 | -4 | -2 | -159 | 322 |
| 1 | -4 | 4 | -12658 | -671 | 3 | 7 | -6 | 5 | -0 | 6 | 3 | -7 | 19 | -4 | 11 | -4 | -1 | 186 | 229 |
| 1 | -4 | 5 | -2214 | -477 | 3 | 7 | -5 | -2 | 33 | 6 | 3 | -6 | -8 | 17 | 11 | -4 | 0 | 515 | -883 |
| 1 | -4 | 6 | -254 | -110 | 3 | 7 | -4 | -10 | -1 | 6 | 3 | -5 | -10 | 14 | 11 | -4 | 1 | -94 | -308 |
| 1 | -4 | 7 | -47 | -3 | 3 | 7 | -3 | 3 | -11 | 6 | 3 | -4 | -14 | -18 | 11 | -4 | 2 | -19 | -38 |
| 1 | -4 | 8 | -17 | -8 | 3 | 7 | -2 | 6 | -0 | 6 | 3 | -3 | -12 | -23 | 11 | -4 | 3 | -4 | 3 |
| 1 | -4 | 9 | -2 | -1 | 3 | 8 | -11 | 3 | 4 | 6 | 3 | -2 | 2 | -10 | 11 | -3 | -5 | 5 | 0 |
| 1 | -3 | -9 | -2 | -1 | 3 | 8 | -10 | 12 | -2 | 6 | 3 | -1 | -6 | 8 | 11 | -3 | -4 | -1 | 12 |
| 1 | -3 | -8 | 2 | -5 | 3 | 8 | -9 | -7 | 7 | 6 | 3 | 0 | 2 | 6 | 11 | -3 | -3 | -33 | -22 |
| 1 | -3 | -7 | 1 | 31 | 3 | 8 | -8 | -17 | 9 | 6 | 4 | -9 | -1 | 2 | 11 | -3 | -2 | -26 | -31 |
| 1 | -3 | -6 | -1 | 18 | 3 | 8 | -7 | 29 | -1 | 6 | 4 | -8 | -1 | -6 | 11 | -3 | -1 | 51 | 4 |
| 1 | -3 | -5 | 14 | -21 | 3 | 8 | -6 | 4 | 1 | 6 | 4 | -7 | 12 | -10 | 11 | -3 | 0 | 64 | 23 |
| 1 | -3 | -4 | 61 | 24 | 3 | 8 | -5 | -7 | -5 | 6 | 4 | -6 | 14 | -16 | 11 | -3 | 1 | 3 | 7 |
| 1 | -3 | -3 | 476 | -47 | 3 | 8 | -4 | 1 | 2 | 6 | 4 | -5 | -10 | 10 | 11 | -3 | 3 | 1 | 0 |
| 1 | -3 | -2 | 4401 | 37 | 3 | 8 | -3 | -1 | 4 | 6 | 4 | -4 | -9 | 14 | 11 | -2 | -10 | -3 | 0 |
| 1 | -3 | -1 | 48060 | 1235 | 3 | 9 | -12 | 2 | 1 | 6 | 4 | -3 | -7 | -6 | 11 | -2 | -9 | -7 | -4 |
| 1 | -3 | 0 | 663475 | 30786 | 3 | 9 | -11 | -3 | 4 | 6 | 4 | -2 | -22 | -41 | 11 | -2 | -8 | -28 | 9 |
| 1 | -3 | 1 | 613316 | -22020 | 3 | 9 | -10 | -5 | -4 | 6 | 4 | -1 | 8 | 1 | 11 | -2 | -7 | 10 | 17 |
| 1 | -3 | 2 | -312436 | -20195 | 3 | 9 | -9 | 5 | -6 | 6 | 4 | 0 | 22 | 37 | 11 | -2 | -6 | 13 | -37 |
| 1 | -3 | 3 | -166539 | 2457 | 3 | 9 | -8 | 1 | 4 | 6 | 4 | 1 | 1 | 3 | 11 | -2 | -5 | 72 | 2 |
| 1 | -3 | 4 | -26133 | 853 | 3 | 9 | -7 | -2 | 2 | 6 | 5 | -9 | 0 | 3 | 11 | -2 | -4 | -46 | 227 |
| 1 | -3 | 5 | -3475 | 142 | 3 | 9 | -6 | -7 | -3 | 6 | 5 | -8 | -3 | 2 | 11 | -2 | -3 | -350 | -587 |
| 1 | -3 | 6 | -441 | 25 | 3 | 10 | -10 | 1 | -1 | 6 | 5 | -7 | -1 | -5 | 11 | -2 | -2 | 791 | -734 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -3 | 7 | -50 | 3 | 3 | 10 | -8 | -1 | 1 | 6 | 5 | -6 | 5 | -1 | 11 | -2 | -1 | -487 | 1052 |
| 1 | -3 | 8 | -21 | -30 | 4 | -14 | 6 | -1 | -2 | 6 | 5 | -4 | -1 | -1 | 11 | -2 | 0 | -105 | 1036 |
| 1 | -3 | 9 | 2 | 7 | 4 | -14 | 7 | 2 | -3 | 6 | 5 | -1 | 1 | 3 | 11 | -2 | 1 | -7 | 76 |
| 1 | -3 | 10 | 1 | 3 | 4 | -14 | 8 | 6 | 4 | 6 | 6 | -6 | -1 | -2 | 11 | -2 | 2 | 2 | 9 |
| 1 | -3 | 11 | 0 | -3 | 4 | -14 | 9 | -1 | 5 | 6 | 6 | -4 | -3 | -4 | 11 | -1 | -5 | -1 | -1 |
| 1 | -2 | -11 | -3 | 3 | 4 | -14 | 10 | -5 | -2 | 7 | -16 | 1 | -2 | 2 | 11 | -1 | -3 | 2 | 2 |
| 1 | -2 | -10 | 3 | -3 | 4 | -14 | 11 | -1 | -2 | 7 | -16 | 3 | 2 | -2 | 11 | -1 | -1 | -1 | -1 |
| 1 | -2 | -9 | -1 | 2 | 4 | -13 | 4 | 0 | 4 | 7 | -15 | 1 | -3 | -2 | 11 | 0 | -3 | 1 | -0 |
| 1 | -2 | -8 | -15 | 13 | 4 | -13 | 5 | -4 | 0 | 7 | -15 | 3 | 3 | 2 | 11 | 0 | -1 | -1 | 0 |
| 1 | -2 | -7 | -3 | 1 | 4 | -13 | 6 | -1 | -19 | 7 | -14 | 4 | 0 | -2 | 11 | 20 | -5 | -8 | -0 |
| 1 | -2 | -6 | 12 | -12 | 4 | -13 | 7 | -8 | 4 | 7 | -14 | 5 | 1 | 1 | 11 | 20 | -3 | 8 | 0 |
| 1 | -2 | -5 | 25 | -46 | 4 | -13 | 8 | 9 | 5 | 7 | -14 | 6 | -2 | 3 | 11 | 21 | -7 | -2 | 2 |
| 1 | -2 | -4 | -40 | -62 | 4 | -13 | 9 | -1 | 5 | 7 | -14 | 7 | -1 | -1 | 11 | 21 | -6 | -24 | 23 |
| 1 | -2 | -3 | -352 | -449 | 4 | -13 | 10 | -6 | -9 | 7 | -14 | 8 | 2 | -1 | 11 | 21 | -5 | -254 | 244 |
| 1 | -2 | -2 | -3398 | -3775 | 4 | -13 | 11 | 4 | -4 | 7 | -13 | 2 | 10 | -2 | 11 | 21 | -3 | 243 | -233 |
| 1 | -2 | -1 | -35999 | -25893 | 4 | -12 | 2 | -3 | 3 | 7 | -13 | 3 | 1 | -10 | 11 | 21 | -2 | 24 | -23 |
| 1 | -2 | 0 | -217061 | 147258 | 4 | -12 | 3 | 1 | -0 | 7 | -13 | 4 | 13 | 2 | 11 | 21 | -1 | 2 | -2 |
| 1 | -2 | 1 | 85569 | -35136 | 4 | -12 | 4 | 4 | -15 | 7 | -13 | 5 | 1 | 11 | 12 | -19 | 1 | 6 | -9 |
| 1 | -2 | 2 | 103905 | -41126 | 4 | -12 | 5 | 2 | 10 | 7 | -13 | 6 | -11 | -2 | 12 | -19 | 3 | -8 | 12 |
| 1 | -2 | 3 | 814 | 4351 | 4 | -12 | 6 | -21 | 13 | 7 | -13 | 7 | 0 | -9 | 12 | -18 | -1 | 2 | 1 |
| 1 | -2 | 4 | -679 | -1278 | 4 | -12 | 7 | -12 | -10 | 7 | -13 | 8 | 3 | 6 | 12 | -18 | 0 | 16 | 10 |
| 1 | -2 | 5 | -1 | -201 | 4 | -12 | 8 | 22 | -18 | 7 | -13 | 9 | -2 | 1 | 12 | -18 | 1 | 157 | 102 |
| 1 | -2 | 6 | 2 | -6 | 4 | -12 | 9 | 20 | 23 | 7 | -12 | -1 | -1 | -3 | 12 | -18 | 2 | 2 | 1 |
| 1 | -2 | 7 | -13 | -55 | 4 | -12 | 10 | -6 | -6 | 7 | -12 | 0 | -2 | 4 | 12 | -18 | 3 | -178 | -116 |
| 1 | -2 | 8 | 18 | 33 | 4 | -12 | 11 | 2 | -11 | 7 | -12 | 1 | -22 | -21 | 12 | -18 | 4 | -16 | -10 |
| 1 | -2 | 9 | -4 | 31 | 4 | -11 | 1 | -0 | -1 | 7 | -12 | 2 | 12 | 17 | 12 | -18 | 5 | -2 | -1 |
| 1 | -2 | 10 | -6 | 2 | 4 | -11 | 2 | -4 | -1 | 7 | -12 | 3 | -9 | 40 | 12 | -17 | 0 | -6 | 2 |
| 1 | -2 | 11 | 1 | -7 | 4 | -11 | 3 | 7 | 3 | 7 | -12 | 4 | -15 | -20 | 12 | -17 | 1 | -73 | 31 |
| 1 | -2 | 12 | -0 | 2 | 4 | -11 | 4 | 18 | 8 | 7 | -12 | 5 | 23 | -7 | 12 | -17 | 3 | 67 | -29 |
| 1 | -1 | -9 | 1 | -5 | 4 | -11 | 5 | -22 | 31 | 7 | -12 | 6 | 20 | 8 | 12 | -17 | 4 | 6 | -2 |
| 1 | -1 | -8 | 15 | -2 | 4 | -11 | 6 | -42 | -47 | 7 | -12 | 7 | -14 | 1 | 12 | -16 | 0 | -1 | -2 |
| 1 | -1 | -7 | 10 | 19 | 4 | -11 | 7 | -8 | -24 | 7 | -12 | 8 | -4 | 1 | 12 | -16 | 1 | -16 | -29 |
| 1 | -1 | -6 | -18 | -30 | 4 | -11 | 8 | 4 | -5 | 7 | -12 | 9 | -2 | -5 | 12 | -16 | 3 | 12 | 22 |
| 1 | -1 | -5 | 42 | -181 | 4 | -11 | 9 | 30 | 38 | 7 | -11 | -1 | 0 | 6 | 12 | -16 | 4 | 1 | 2 |
| 1 | -1 | -4 | 352 | -1611 | 4 | -11 | 10 | 2 | -12 | 7 | -11 | 0 | -11 | 37 | 12 | -15 | 0 | -1 | -3 |
| 1 | -1 | -3 | 3248 | -14201 | 4 | -11 | 11 | -2 | -5 | 7 | -11 | 1 | -187 | -231 | 12 | -15 | 1 | -30 | -65 |
| 1 | -1 | -2 | 26546 | -124624 | 4 | -10 | 0 | 3 | -4 | 7 | -11 | 2 | -58 | 129 | 12 | -15 | 2 | -0 | 23 |
| 1 | -1 | -1 | 159106 | -1037547 | 4 | -10 | 1 | 28 | -1 | 7 | -11 | 3 | -14 | 102 | 12 | -15 | 3 | 20 | 43 |
| 1 | -1 | 0 | -97581 | 64290 | 4 | -10 | 2 | -11 | -34 | 7 | -11 | 4 | 53 | -111 | 12 | -15 | 4 | 1 | -3 |
| 1 | -1 | 1 | -181609 | 1148886 | 4 | -10 | 3 | 65 | -23 | 7 | -11 | 5 | 47 | -18 | 12 | -14 | -1 | -0 | 1 |
| 1 | -1 | 2 | 6474 | 111424 | 4 | -10 | 4 | 82 | 72 | 7 | -11 | 6 | -21 | 16 | 12 | -14 | 0 | -3 | -8 |
| 1 | -1 | 3 | 1645 | 11697 | 4 | -10 | 5 | -88 | 62 | 7 | -11 | 7 | 12 | -10 | 12 | -14 | 1 | -67 | -183 |
| 1 | -1 | 4 | 208 | 1408 | 4 | -10 | 6 | -53 | -3 | 7 | -11 | 8 | 11 | 13 | 12 | -14 | 2 | -41 | -12 |
| 1 | -1 | 5 | -9 | 135 | 4 | -10 | 7 | -5 | -49 | 7 | -11 | 9 | -9 | -2 | 12 | -14 | 3 | 24 | 95 |
| 1 | -1 | 6 | -1 | 52 | 4 | -10 | 8 | -36 | -24 | 7 | -10 | -3 | 0 | 3 | 12 | -14 | 4 | 17 | 13 |
| 1 | -1 | 7 | -8 | -15 | 4 | -10 | 9 | 55 | 36 | 7 | -10 | -2 | 1 | 21 | 12 | -14 | 5 | 5 | -2 |
| 1 | -1 | 8 | -24 | -30 | 4 | -10 | 10 | -4 | -3 | 7 | -10 | -1 | -4 | 186 | 12 | -13 | -1 | -4 | 1 |
| 1 | -1 | 9 | 11 | 41 | 4 | -9 | -2 | 2 | -3 | 7 | -10 | 0 | -32 | 1753 | 12 | -13 | 0 | -11 | -3 |
| 1 | -1 | 10 | 7 | 8 | 4 | -9 | -1 | 17 | -26 | 7 | -10 | 1 | -1552 | -3982 | 12 | -13 | 1 | 512 | -193 |
| 1 | -1 | 11 | -1 | -6 | 4 | -9 | 0 | 179 | -228 | 7 | -10 | 2 | -471 | -1927 | 12 | -13 | 2 | 84 | -44 |
| 1 | 0 | -8 | 7 | 5 | 4 | -9 | 1 | 434 | 296 | 7 | -10 | 3 | 574 | 1177 | 12 | -13 | 3 | -207 | 73 |
| 1 | 0 | -7 | -0 | -17 | 4 | -9 | 2 | -26 | -40 | 7 | -10 | 4 | 136 | 120 | 12 | -13 | 4 | -32 | 22 |
| 1 | 0 | -6 | -35 | -30 | 4 | -9 | 3 | 267 | -7 | 7 | -10 | 5 | 24 | 6 | 12 | -13 | 5 | -0 | 5 |
| 1 | 0 | -5 | -106 | -228 | 4 | -9 | 4 | -53 | 457 | 7 | -10 | 6 | 34 | 2 | 12 | -12 | -2 | -2 | -5 |
| 1 | 0 | -4 | -998 | -1650 | 4 | -9 | 5 | -245 | 19 | 7 | -10 | 7 | 31 | -11 | 12 | -12 | -1 | -5 | -48 |
| 1 | 0 | -3 | -8136 | -13147 | 4 | -9 | 6 | -82 | -30 | 7 | -10 | 8 | -19 | 8 | 12 | -12 | 0 | 52 | -455 |
| 1 | 0 | -2 | -60327 | -95534 | 4 | -9 | 7 | -21 | -2 | 7 | -10 | 9 | -2 | 1 | 12 | -12 | 1 | 212 | 1037 |
| 1 | 0 | -1 | -90791 | -18307 | 4 | -9 | 8 | -23 | -3 | 7 | -9 | -5 | -1 | 6 | 12 | -12 | 2 | -40 | 642 |
| 1 | 0 | 0 | 132894 | 262122 | 4 | -9 | 9 | 43 | -7 | 7 | -9 | -4 | -9 | 55 | 12 | -12 | 3 | -67 | -324 |
| 1 | 0 | 1 | 93791 | 32001 | 4 | -9 | 10 | 3 | 0 | 7 | -9 | -3 | -79 | 484 | 12 | -12 | 4 | -16 | -51 |
| 1 | 0 | 2 | 12926 | 3465 | 4 | -9 | 11 | 1 | -0 | 7 | -9 | -2 | -724 | 4401 | 12 | -12 | 5 | -2 | -6 |
| 1 | 0 | 3 | 1558 | 426 | 4 | -8 | -5 | 6 | -7 | 7 | -9 | -1 | -7000 | 42216 | 12 | -11 | -4 | 3 | 2 |
| 1 | 0 | 4 | 185 | 33 | 4 | -8 | -4 | 49 | -64 | 7 | -9 | 0 | -77043 | 460008 | 12 | -11 | -3 | 27 | 15 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 5 | -42 | -46 | 4 | -8 | -3 | 425 | -556 | 7 | -9 | 1 | 1739 | 115817 | 12 | -11 | -2 | 258 | 144 |
| 1 | 0 | 6 | 13 | 8 | 4 | -8 | -2 | 3845 | -5029 | 7 | -9 | 2 | 74615 | -443344 | 12 | -11 | -1 | 2458 | 1310 |
| 1 | 0 | 7 | 6 | 2 | 4 | -8 | -1 | 36680 | -47892 | 7 | -9 | 3 | 6564 | -79361 | 12 | -11 | 0 | 26332 | 12026 |
| 1 | 0 | 8 | -2 | -1 | 4 | -8 | 0 | 391458 | -510186 | 7 | -9 | 4 | 665 | -9560 | 12 | -11 | 1 | 3932 | -100 |
| 1 | 1 | -12 | -1 | -0 | 4 | -8 | 1 | 22407 | 66172 | 7 | -9 | 5 | 71 | -1107 | 12 | -11 | 2 | -25415 | -11694 |
| 1 | 1 | -11 | -13 | -2 | 4 | -8 | 2 | -395199 | 521216 | 7 | -9 | 6 | -25 | -139 | 12 | -11 | 3 | -3727 | -1264 |
| 1 | 1 | -10 | 6 | -4 | 4 | -8 | 3 | -42929 | 27375 | 7 | -9 | 7 | 29 | -57 | 12 | -11 | 4 | -437 | -138 |
| 1 | 1 | -9 | 26 | 1 | 4 | -8 | 4 | -5804 | 2523 | 7 | -9 | 8 | 1 | 5 | 12 | -11 | 5 | -51 | -15 |
| 1 | 1 | -8 | 8 | 10 | 4 | -8 | 5 | -838 | 216 | 7 | -8 | -4 | -1 | -1 | 12 | -11 | 6 | -6 | -2 |
| 1 | 1 | -7 | 6 | -20 | 4 | -8 | 6 | -98 | -13 | 7 | -8 | -3 | -15 | -7 | 12 | -10 | -2 | -8 | 5 |
| 1 | 1 | -6 | -89 | 14 | 4 | -8 | 7 | -33 | 39 | 7 | -8 | -2 | -141 | -62 | 12 | -10 | -1 | -94 | 32 |
| 1 | 1 | -5 | -580 | -57 | 4 | -8 | 8 | 29 | -20 | 7 | -8 | -1 | -1483 | -640 | 12 | -10 | 0 | -314 | 317 |
| 1 | 1 | -4 | -4359 | -733 | 4 | -8 | 9 | 4 | -5 | 7 | -8 | 0 | -19641 | -7331 | 12 | -10 | 1 | 52 | 233 |
| 1 | 1 | -3 | -29928 | -5022 | 4 | -8 | 10 | 3 | -5 | 7 | -8 | 1 | -19921 | -3213 | 12 | -10 | 2 | 265 | -260 |
| 1 | 1 | -2 | -67737 | -11855 | 4 | -8 | 11 | 1 | -1 | 7 | -8 | 2 | 15852 | 5541 | 12 | -10 | 3 | 58 | -104 |
| 1 | 1 | -1 | 100220 | 9938 | 4 | -7 | -4 | 4 | -4 | 7 | -8 | 3 | 7044 | 1870 | 12 | -10 | 4 | 4 | -8 |
| 1 | 1 | 0 | 150794 | 28896 | 4 | -7 | -3 | 38 | -36 | 7 | -8 | 4 | 866 | 292 | 12 | -9 | -3 | 3 | -0 |
| 1 | 1 | 1 | 12517 | 6775 | 4 | -7 | -2 | 383 | -352 | 7 | -8 | 5 | 111 | 29 | 12 | -9 | -2 | -1 | -2 |
| 1 | 1 | 2 | 1177 | 775 | 4 | -7 | -1 | 3785 | -3480 | 7 | -8 | 6 | 24 | -33 | 12 | -9 | -1 | 4 | -53 |
| 1 | 1 | 3 | 118 | 104 | 4 | -7 | 0 | 44226 | -40652 | 7 | -8 | 7 | -3 | -22 | 12 | -9 | 0 | -39 | -114 |
| 1 | 1 | 4 | -2 | 14 | 4 | -7 | 1 | 16847 | -50708 | 7 | -8 | 8 | -3 | -6 | 12 | -9 | 1 | -83 | 2 |
| 1 | 1 | 5 | 16 | -9 | 4 | -7 | 2 | -25720 | 33514 | 7 | -7 | -3 | 21 | -9 | 12 | -9 | 2 | 39 | 84 |
| 1 | 1 | 6 | 7 | -4 | 4 | -7 | 3 | -9967 | 21216 | 7 | -7 | -2 | 182 | -67 | 12 | -9 | 3 | 23 | 34 |
| 1 | 1 | 7 | 9 | -21 | 4 | -7 | 4 | -2653 | 3060 | 7 | -7 | -1 | 1614 | -650 | 12 | -9 | 4 | -5 | 3 |
| 1 | 1 | 8 | -1 | 4 | 4 | -7 | 5 | -282 | 88 | 7 | -7 | 0 | 10949 | -9276 | 12 | -9 | 5 | 1 | 0 |
| 1 | 1 | 9 | -3 | 4 | 4 | -7 | 6 | -31 | -25 | 7 | -7 | 1 | 5788 | -10629 | 12 | -8 | -3 | -0 | 4 |
| 1 | 2 | -13 | -6 | 3 | 4 | -7 | 7 | 13 | -4 | 7 | -7 | 2 | -6296 | 7478 | 12 | -8 | -2 | 1 | -3 |
| 1 | 2 | -12 | -15 | 12 | 4 | -7 | 8 | -0 | -49 | 7 | -7 | 3 | -2451 | 3460 | 12 | -8 | -1 | 30 | 5 |
| 1 | 2 | -11 | 12 | -9 | 4 | -7 | 9 | 1 | -4 | 7 | -7 | 4 | -463 | 294 | 12 | -8 | 0 | 81 | -37 |
| 1 | 2 | -10 | 80 | -55 | 4 | -7 | 10 | 0 | -1 | 7 | -7 | 5 | -40 | 36 | 12 | -8 | 1 | 68 | -88 |
| 1 | 2 | -9 | -10 | 12 | 4 | -6 | -4 | 8 | -6 | 7 | -7 | 6 | -55 | -29 | 12 | -8 | 2 | -52 | 31 |
| 1 | 2 | -8 | -37 | 47 | 4 | -6 | -3 | 82 | -29 | 7 | -7 | 7 | -2 | -4 | 12 | -8 | 3 | -40 | 25 |
| 1 | 2 | -7 | 11 | -11 | 4 | -6 | -2 | 773 | -269 | 7 | -7 | 8 | -1 | -0 | 12 | -8 | 4 | -1 | -3 |
| 1 | 2 | -6 | -68 | 23 | 4 | -6 | -1 | 7915 | -2732 | 7 | -6 | -4 | 0 | 3 | 12 | -7 | -3 | -2 | -2 |
| 1 | 2 | -5 | -457 | 69 | 4 | -6 | 0 | 100462 | -34251 | 7 | -6 | -3 | -2 | 41 | 12 | -7 | -2 | 0 | -2 |
| 1 | 2 | -4 | -3420 | 850 | 4 | -6 | 1 | 118016 | -79762 | 7 | -6 | -2 | 8 | 317 | 12 | -7 | -1 | -23 | 16 |
| 1 | 2 | -3 | -15758 | 2009 | 4 | -6 | 2 | -61991 | 40739 | 7 | -6 | -1 | 812 | 2535 | 12 | -7 | 0 | -49 | 53 |
| 1 | 2 | -2 | -17047 | 2342 | 4 | -6 | 3 | -35784 | 25526 | 7 | -6 | 0 | 16293 | 12503 | 12 | -7 | 1 | 22 | -69 |
| 1 | 2 | -1 | 62831 | -11981 | 4 | -6 | 4 | -5720 | 1049 | 7 | -6 | 1 | 16685 | 5666 | 12 | -7 | 2 | 22 | -25 |
| 1 | 2 | 0 | 87118 | -24287 | 4 | -6 | 5 | -898 | -233 | 7 | -6 | 2 | -7334 | -7060 | 12 | -7 | 3 | 4 | 17 |
| 1 | 2 | 1 | 6621 | -1832 | 4 | -6 | 6 | -116 | -74 | 7 | -6 | 3 | -4530 | -2685 | 12 | -7 | 4 | 0 | 2 |
| 1 | 2 | 2 | 637 | -224 | 4 | -6 | 7 | -40 | -35 | 7 | -6 | 4 | -797 | -387 | 12 | -6 | -3 | -0 | -1 |
| 1 | 2 | 3 | 72 | -30 | 4 | -6 | 8 | -10 | -10 | 7 | -6 | 5 | -101 | -58 | 12 | -6 | -2 | -5 | -12 |
| 1 | 2 | 4 | -2 | 5 | 4 | -6 | 9 | -2 | -2 | 7 | -6 | 6 | -28 | -3 | 12 | -6 | -1 | -39 | -82 |
| 1 | 2 | 5 | -12 | 14 | 4 | -5 | -4 | 11 | 13 | 7 | -6 | 7 | -11 | -3 | 12 | -6 | 0 | 27 | 63 |
| 1 | 2 | 6 | 20 | -1 | 4 | -5 | -3 | 78 | 120 | 7 | -5 | -5 | -2 | 1 | 12 | -6 | 1 | 46 | 100 |
| 1 | 2 | 7 | -11 | 17 | 4 | -5 | -2 | 723 | 1175 | 7 | -5 | -4 | -7 | -8 | 12 | -6 | 2 | -8 | -8 |
| 1 | 2 | 8 | -1 | -4 | 4 | -5 | -1 | 7994 | 12590 | 7 | -5 | -3 | -26 | -22 | 12 | -6 | 3 | -0 | -1 |
| 1 | 2 | 9 | 2 | -3 | 4 | -5 | 0 | 126010 | 178243 | 7 | -5 | -2 | -365 | -354 | 12 | -5 | -3 | 11 | 7 |
| 1 | 3 | -12 | 1 | -1 | 4 | -5 | 1 | 148735 | 149591 | 7 | -5 | -1 | -2534 | -2132 | 12 | -5 | -2 | 54 | 33 |
| 1 | 3 | -11 | 10 | -4 | 4 | -5 | 2 | -54329 | -93947 | 7 | -5 | 0 | -3037 | -4086 | 12 | -5 | -1 | -77 | -15 |
| 1 | 3 | -10 | 12 | -11 | 4 | -5 | 3 | -40786 | -45215 | 7 | -5 | 1 | 9151 | -2423 | 12 | -5 | 0 | -206 | -104 |
| 1 | 3 | -9 | -73 | 33 | 4 | -5 | 4 | -7830 | -7266 | 7 | -5 | 2 | 2137 | 2262 | 12 | -5 | 1 | 66 | 9 |
| 1 | 3 | -8 | -20 | 16 | 4 | -5 | 5 | -1131 | -975 | 7 | -5 | 3 | -891 | 1267 | 12 | -5 | 2 | 11 | 1 |
| 1 | 3 | -7 | -34 | 25 | 4 | -5 | 6 | -137 | -127 | 7 | -5 | 4 | -195 | 193 | 12 | -4 | -5 | -4 | 1 |
| 1 | 3 | -6 | -47 | 32 | 4 | -5 | 7 | -42 | -21 | 7 | -5 | 5 | -29 | 36 | 12 | -4 | -4 | -35 | 14 |
| 1 | 3 | -5 | -355 | 334 | 4 | -5 | 8 | -7 | -2 | 7 | -5 | 6 | -6 | 7 | 12 | -4 | -3 | -162 | 39 |
| 1 | 3 | -4 | -964 | 424 | 4 | -4 | -5 | -6 | -8 | 7 | -4 | -5 | 1 | -5 | 12 | -4 | -2 | -683 | 152 |
| 1 | 3 | -3 | -518 | -4199 | 4 | -4 | -4 | -14 | -46 | 7 | -4 | -4 | 22 | -12 | 12 | -4 | -1 | 485 | -59 |
| 1 | 3 | -2 | -2421 | -2933 | 4 | -4 | -3 | -133 | -335 | 7 | -4 | -3 | 225 | -108 | 12 | -4 | 0 | 1817 | -445 |
| 1 | 3 | -1 | 13383 | 1494 | 4 | -4 | -2 | -1301 | -3004 | 7 | -4 | -2 | 1436 | -1150 | 12 | -4 | 1 | 151 | -55 |
| 1 | 3 | 0 | 17442 | -4628 | 4 | -4 | -1 | -12426 | -27000 | 7 | -4 | -1 | 8799 | -9304 | 12 | -4 | 2 | 3 | -9 |
| 1 | 3 | 1 | 1359 | -355 | 4 | -4 | 0 | 4798 | -62407 | 7 | -4 | 0 | -3225 | 4006 | 12 | -4 | 3 | -4 | -2 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 2 | 135 | -32 | 4 | -4 | 1 | 118411 | -3898 | 7 | -4 | 1 | -10909 | 10921 | 12 | -3 | -5 | -3 | -2 |
| 1 | 3 | 3 | 82 | -39 | 4 | -4 | 2 | 2954 | 32282 | 7 | -4 | 2 | -479 | -315 | 12 | -3 | -4 | -2 | 6 |
| 1 | 3 | 4 | -2 | -12 | 4 | -4 | 3 | -19925 | 11539 | 7 | -4 | 3 | -48 | 89 | 12 | -3 | -3 | -9 | 32 |
| 1 | 3 | 5 | -23 | -9 | 4 | -4 | 4 | -3345 | 1748 | 7 | -4 | 4 | -13 | 6 | 12 | -3 | -2 | 2 | 10 |
| 1 | 3 | 6 | -1 | -6 | 4 | -4 | 5 | -518 | 239 | 7 | -4 | 5 | 6 | 2 | 12 | -3 | -1 | 30 | -49 |
| 1 | 3 | 7 | -1 | 3 | 4 | -4 | 6 | -49 | 49 | 7 | -4 | 6 | -0 | 3 | 12 | -3 | 0 | -21 | -34 |
| 1 | 4 | -10 | 1 | 2 | 4 | -4 | 7 | -17 | 7 | 7 | -3 | -6 | -6 | 1 | 12 | -3 | 2 | 5 | 1 |
| 1 | 4 | -9 | 3 | 12 | 4 | -4 | 8 | -3 | 1 | 7 | -3 | -5 | -10 | 14 | 12 | -2 | -10 | 2 | 0 |
| 1 | 4 | -8 | -5 | 5 | 4 | -3 | -6 | 1 | -1 | 7 | -3 | -4 | -14 | 117 | 12 | -2 | -9 | 3 | -3 |
| 1 | 4 | -7 | 17 | 65 | 4 | -3 | -5 | 21 | -5 | 7 | -3 | -3 | -86 | 965 | 12 | -2 | -8 | -6 | 12 |
| 1 | 4 | -6 | -64 | -1 | 4 | -3 | -4 | 224 | -78 | 7 | -3 | -2 | -870 | 6153 | 12 | -2 | -7 | -20 | 2 |
| 1 | 4 | -5 | -199 | -61 | 4 | -3 | -3 | 1836 | -591 | 7 | -3 | -1 | -2765 | -11727 | 12 | -2 | -6 | -2 | -13 |
| 1 | 4 | -4 | -216 | -1328 | 4 | -3 | -2 | 14846 | -5454 | 7 | -3 | 0 | 1384 | -23798 | 12 | -2 | -5 | 26 | -7 |
| 1 | 4 | -3 | 140 | -2068 | 4 | -3 | -1 | 101034 | -52747 | 7 | -3 | 1 | 2857 | 11016 | 12 | -2 | -4 | -26 | 89 |
| 1 | 4 | -2 | -632 | -295 | 4 | -3 | 0 | -52006 | 64149 | 7 | -3 | 2 | 472 | 1413 | 12 | -2 | -3 | -41 | -119 |
| 1 | 4 | -1 | 1900 | 1401 | 4 | -3 | 1 | -130534 | 72030 | 7 | -3 | 3 | 49 | 141 | 12 | -2 | -2 | 153 | -66 |
| 1 | 4 | 0 | 3399 | -544 | 4 | -3 | 2 | 3388 | -20551 | 7 | -3 | 4 | 13 | -9 | 12 | -2 | -1 | -136 | 154 |
| 1 | 4 | 1 | 238 | -21 | 4 | -3 | 3 | 987 | -3066 | 7 | -3 | 5 | 4 | 1 | 12 | -2 | 0 | -36 | 127 |
| 1 | 4 | 2 | 21 | 21 | 4 | -3 | 4 | 86 | -482 | 7 | -3 | 6 | -2 | 7 | 12 | -2 | 1 | -2 | 8 |
| 1 | 4 | 3 | -7 | -15 | 4 | -3 | 5 | 11 | -60 | 7 | -2 | -8 | -5 | -7 | 12 | 20 | -6 | -7 | -2 |
| 1 | 4 | 4 | 0 | -5 | 4 | -3 | 6 | 18 | -9 | 7 | -2 | -7 | -27 | -51 | 12 | 20 | -5 | -74 | -24 |
| 1 | 4 | 5 | -1 | 5 | 4 | -3 | 7 | 1 | -1 | 7 | -2 | -6 | -135 | -286 | 12 | 20 | -3 | 81 | 27 |
| 1 | 4 | 6 | -4 | -1 | 4 | -3 | 8 | -3 | 0 | 7 | -2 | -5 | -1315 | -2072 | 12 | 20 | -2 | 7 | 2 |
| 1 | 5 | -10 | -1 | 2 | 4 | -2 | -8 | 1 | -0 | 7 | -2 | -4 | -10189 | -15678 | 12 | 21 | -6 | -10 | 3 |
| 1 | 5 | -9 | 15 | 33 | 4 | -2 | -7 | 4 | 7 | 7 | -2 | -3 | -68442 | -104373 | 12 | 21 | -5 | -103 | 34 |
| 1 | 5 | -8 | 19 | 0 | 4 | -2 | -6 | 4 | 28 | 7 | -2 | -2 | -273393 | -388315 | 12 | 21 | -3 | 89 | -29 |
| 1 | 5 | -7 | -11 | -10 | 4 | -2 | -5 | -61 | 225 | 7 | -2 | -1 | 149718 | 288343 | 12 | 21 | -2 | 10 | -3 |
| 1 | 5 | -6 | -61 | -52 | 4 | -2 | -4 | -332 | 1854 | 7 | -2 | 0 | 731174 | 1052362 | 12 | 22 | -5 | -2 | -0 |
| 1 | 5 | -5 | -220 | -271 | 4 | -2 | -3 | -1793 | 15134 | 7 | -2 | 1 | 70479 | 70137 | 12 | 22 | -3 | 2 | 0 |
| 1 | 5 | -4 | -134 | -433 | 4 | -2 | -2 | -10641 | 124199 | 7 | -2 | 2 | 6557 | 5682 | 13 | -20 | 1 | 2 | -2 |
| 1 | 5 | -3 | 170 | -437 | 4 | -2 | -1 | 67337 | 695013 | 7 | -2 | 3 | 689 | 562 | 13 | -20 | 3 | -2 | 2 |
| 1 | 5 | -2 | -575 | 32 | 4 | -2 | 0 | 320631 | 231753 | 7 | -2 | 4 | 77 | 60 | 13 | -19 | 0 | 5 | -4 |
| 1 | 5 | -1 | 179 | 439 | 4 | -2 | 1 | -58869 | -723536 | 7 | -2 | 5 | 9 | 7 | 13 | -19 | 1 | 43 | -29 |
| 1 | 5 | 0 | 1079 | -43 | 4 | -2 | 2 | -99259 | -214437 | 7 | -1 | -8 | -1 | -1 | 13 | -19 | 3 | -57 | 39 |
| 1 | 5 | 1 | 84 | -14 | 4 | -2 | 3 | -12775 | -27310 | 7 | -1 | -7 | 11 | -15 | 13 | -19 | 4 | -5 | 4 |
| 1 | 5 | 2 | 15 | 3 | 4 | -2 | 4 | -1527 | -3270 | 7 | -1 | -6 | 49 | -15 | 13 | -18 | -2 | 3 | 6 |
| 1 | 5 | 3 | -3 | -3 | 4 | -2 | 5 | -181 | -380 | 7 | -1 | -5 | -8 | 30 | 13 | -18 | -1 | 29 | 52 |
| 1 | 6 | -11 | 3 | 2 | 4 | -2 | 6 | -57 | -63 | 7 | -1 | -4 | -255 | 8 | 13 | -18 | 0 | 273 | 484 |
| 1 | 6 | -9 | -15 | -2 | 4 | -2 | 7 | -9 | -5 | 7 | -1 | -3 | -892 | -83 | 13 | -18 | 1 | 2906 | 5148 |
| 1 | 6 | -8 | 33 | -22 | 4 | -2 | 8 | 11 | 10 | 7 | -1 | -2 | -1467 | 908 | 13 | -18 | 2 | -8 | 16 |
| 1 | 6 | -7 | -26 | -0 | 4 | -2 | 9 | 1 | 0 | 7 | -1 | -1 | 3106 | -677 | 13 | -18 | 3 | -3003 | -5319 |
| 1 | 6 | -6 | -93 | -13 | 4 | -1 | -8 | -1 | 0 | 7 | -1 | 0 | 5160 | -995 | 13 | -18 | 4 | -271 | -489 |
| 1 | 6 | -5 | -135 | -65 | 4 | -1 | -7 | -12 | 0 | 7 | -1 | 1 | 357 | -61 | 13 | -18 | 5 | -29 | -52 |
| 1 | 6 | -4 | -91 | -108 | 4 | -1 | -6 | -10 | -14 | 7 | -1 | 2 | 37 | 25 | 13 | -18 | 6 | -3 | -6 |
| 1 | 6 | -3 | -553 | 131 | 4 | -1 | -5 | 46 | -174 | 7 | -1 | 3 | 6 | 1 | 13 | -17 | 0 | -6 | 2 |
| 1 | 6 | -2 | -6457 | 251 | 4 | -1 | -4 | 701 | -1960 | 7 | -1 | 4 | -1 | -4 | 13 | -17 | 1 | -76 | 22 |
| 1 | 6 | -1 | 147 | -436 | 4 | -1 | -3 | 4829 | -14514 | 7 | 0 | -7 | 4 | 4 | 13 | -17 | 3 | 64 | -19 |
| 1 | 6 | 0 | 6423 | -264 | 4 | -1 | -2 | 20876 | -66293 | 7 | 0 | -6 | -1 | 16 | 13 | -17 | 4 | 6 | -2 |
| 1 | 6 | 1 | 611 | -28 | 4 | -1 | -1 | -13886 | 26866 | 7 | 0 | -5 | -28 | 17 | 13 | -16 | 0 | -4 | 0 |
| 1 | 6 | 2 | 62 | -4 | 4 | -1 | 0 | -57249 | 177725 | 7 | 0 | -4 | -109 | 22 | 13 | -16 | 1 | -56 | 3 |
| 1 | 6 | 3 | 6 | 1 | 4 | -1 | 1 | -1129 | 15539 | 7 | 0 | -3 | -207 | -169 | 13 | -16 | 3 | 40 | -2 |
| 1 | 6 | 4 | -1 | -1 | 4 | -1 | 2 | -16 | 1377 | 7 | 0 | -2 | -253 | -530 | 13 | -16 | 4 | 4 | -0 |
| 1 | 7 | -12 | 2 | -0 | 4 | -1 | 3 | 46 | 139 | 7 | 0 | -1 | 991 | 539 | 13 | -15 | -1 | -0 | 1 |
| 1 | 7 | -11 | 6 | -1 | 4 | -1 | 4 | -1 | 26 | 7 | 0 | 0 | 1435 | 124 | 13 | -15 | 0 | -6 | 1 |
| 1 | 7 | -10 | 30 | -6 | 4 | -1 | 5 | -6 | 0 | 7 | 0 | 1 | 125 | 8 | 13 | -15 | 1 | -82 | -5 |
| 1 | 7 | -9 | 0 | -8 | 4 | -1 | 6 | 9 | -2 | 7 | 0 | 2 | 10 | 2 | 13 | -15 | 2 | -7 | 24 |
| 1 | 7 | -8 | 57 | -29 | 4 | -1 | 7 | -2 | -0 | 7 | 0 | 3 | -5 | 1 | 13 | -15 | 3 | 52 | 2 |
| 1 | 7 | -7 | -43 | 46 | 4 | -1 | 8 | -8 | -1 | 7 | 1 | -7 | -7 | 2 | 13 | -15 | 4 | 9 | -8 |
| 1 | 7 | -6 | -87 | 23 | 4 | 0 | -8 | -2 | 5 | 7 | 1 | -6 | -16 | 48 | 13 | -15 | 5 | 0 | -1 |
| 1 | 7 | -5 | -44 | -24 | 4 | 0 | -7 | -12 | -0 | 7 | 1 | -5 | -3 | -21 | 13 | -14 | -1 | -0 | 1 |
| 1 | 7 | -4 | 27 | -9 | 4 | 0 | -6 | -56 | 34 | 7 | 1 | -4 | -29 | -25 | 13 | -14 | 0 | -3 | -7 |
| 1 | 7 | -3 | 13 | -4 | 4 | 0 | -5 | -202 | -73 | 7 | 1 | -3 | -20 | -197 | 13 | -14 | 1 | -48 | -244 |
| 1 | 7 | -2 | 6 | -9 | 4 | 0 | -4 | -1716 | -431 | 7 | 1 | -2 | 76 | -103 | 13 | -14 | 2 | -17 | -30 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7 | -1 | 2 | -3 | 4 | 0 | -3 | -9745 | -1577 | 7 | 1 | -1 | 75 | 194 | 13 | -14 | 3 | 20 | 112 |
| 1 | 7 | 0 | -0 | 2 | 4 | 0 | -2 | -23868 | -2041 | 7 | 1 | 0 | 213 | 73 | 13 | -14 | 4 | 9 | 18 |
| 1 | 8 | -11 | -4 | 7 | 4 | 0 | -1 | 33440 | 5279 | 7 | 1 | 1 | 16 | 7 | 13 | -13 | -2 | -1 | -0 |
| 1 | 8 | -10 | 19 | -12 | 4 | 0 | 0 | 61870 | 8001 | 7 | 1 | 2 | -2 | 4 | 13 | -13 | -1 | -7 | -2 |
| 1 | 8 | -9 | 25 | -9 | 4 | 0 | 1 | 4624 | 509 | 7 | 1 | 3 | -1 | -0 | 13 | -13 | 0 | -42 | -17 |
| 1 | 8 | -8 | 13 | 11 | 4 | 0 | 2 | 404 | 38 | 7 | 2 | -9 | 1 | 1 | 13 | -13 | 1 | 376 | -2 |
| 1 | 8 | -7 | -27 | 13 | 4 | 0 | 3 | 43 | 7 | 7 | 2 | -8 | 6 | 1 | 13 | -13 | 2 | 87 | 35 |
| 1 | 8 | -6 | -40 | 15 | 4 | 0 | 4 | 6 | 3 | 7 | 2 | -7 | 8 | 11 | 13 | -13 | 3 | -141 | 2 |
| 1 | 8 | -5 | -2 | 31 | 4 | 1 | -9 | 1 | -2 | 7 | 2 | -6 | -19 | 23 | 13 | -13 | 4 | -15 | -3 |
| 1 | 8 | -4 | -7 | 2 | 4 | 1 | -8 | 6 | -28 | 7 | 2 | -5 | -18 | 8 | 13 | -12 | -3 | 0 | -2 |
| 1 | 8 | -3 | 1 | -11 | 4 | 1 | -7 | -21 | 7 | 7 | 2 | -4 | -28 | -48 | 13 | -12 | -2 | 1 | -9 |
| 1 | 8 | -2 | 6 | -2 | 4 | 1 | -6 | -37 | 130 | 7 | 2 | -3 | 15 | -63 | 13 | -12 | -1 | 31 | -87 |
| 1 | 8 | -1 | 1 | -0 | 4 | 1 | -5 | -239 | 72 | 7 | 2 | -2 | 12 | -8 | 13 | -12 | 0 | 635 | -863 |
| 1 | 8 | 0 | 2 | 0 | 4 | 1 | -4 | -714 | -12 | 7 | 2 | -1 | -7 | 46 | 13 | -12 | 1 | -116 | 736 |
| 1 | 9 | -12 | -3 | 6 | 4 | 1 | -3 | -1131 | -1764 | 7 | 2 | 0 | 29 | 21 | 13 | -12 | 2 | -717 | 996 |
| 1 | 9 | -11 | -3 | 10 | 4 | 1 | -2 | 55 | -5141 | 7 | 2 | 1 | 2 | -2 | 13 | -12 | 3 | 14 | -165 |
| 1 | 9 | -10 | 17 | 0 | 4 | 1 | -1 | 5375 | 6464 | 7 | 2 | 2 | 0 | -1 | 13 | -12 | 4 | 6 | -24 |
| 1 | 9 | -9 | -8 | 1 | 4 | 1 | 0 | 9983 | 5011 | 7 | 3 | -8 | -6 | -5 | 13 | -12 | 5 | 0 | -2 |
| 1 | 9 | -8 | -33 | 2 | 4 | 1 | 1 | 750 | 415 | 7 | 3 | -7 | 19 | 1 | 13 | -11 | -2 | 3 | 12 |
| 1 | 9 | -7 | 19 | 17 | 4 | 1 | 2 | 89 | 20 | 7 | 3 | -6 | 5 | 21 | 13 | -11 | -1 | 36 | 116 |
| 1 | 9 | -6 | 6 | 15 | 4 | 1 | 3 | 3 | 29 | 7 | 3 | -5 | -2 | 20 | 13 | -11 | 0 | 497 | 725 |
| 1 | 9 | -5 | -4 | 2 | 4 | 1 | 4 | -9 | 7 | 7 | 3 | -4 | -13 | -21 | 13 | -11 | 1 | 296 | 46 |
| 1 | 10 | -12 | 1 | 3 | 4 | 1 | 5 | -2 | -3 | 7 | 3 | -3 | -4 | -16 | 13 | -11 | 2 | -434 | -653 |
| 1 | 10 | -11 | -3 | 5 | 4 | 1 | 6 | 1 | -3 | 7 | 3 | -2 | -15 | -8 | 13 | -11 | 3 | -131 | -122 |
| 1 | 10 | -10 | -4 | -1 | 4 | 2 | -10 | -2 | -0 | 7 | 3 | -1 | -6 | 7 | 13 | -11 | 4 | -16 | -14 |
| 1 | 10 | -9 | 0 | -7 | 4 | 2 | -9 | 0 | 14 | 7 | 3 | 0 | 18 | 7 | 13 | -10 | -2 | -2 | -1 |
| 1 | 10 | -8 | 3 | -3 | 4 | 2 | -8 | -11 | 14 | 7 | 3 | 1 | 2 | 0 | 13 | -10 | -1 | -26 | -9 |
| 1 | 10 | -7 | 3 | 2 | 4 | 2 | -7 | -50 | 47 | 7 | 4 | -8 | -5 | -3 | 13 | -10 | 0 | -92 | 25 |
| 1 | 10 | -6 | 0 | 1 | 4 | 2 | -6 | -5 | -84 | 7 | 4 | -7 | 4 | -3 | 13 | -10 | 1 | -14 | 69 |
| 2 | -15 | 8 | 1 | 1 | 4 | 2 | -5 | -16 | -21 | 7 | 4 | -6 | -3 | 7 | 13 | -10 | 2 | 72 | -16 |
| 2 | -15 | 9 | -0 | 3 | 4 | 2 | -4 | -50 | -192 | 7 | 4 | -5 | -10 | -2 | 13 | -10 | 3 | 22 | -15 |
| 2 | -15 | 10 | -4 | -1 | 4 | 2 | -3 | 550 | -1416 | 7 | 4 | -4 | -6 | 9 | 13 | -10 | 4 | 3 | -3 |
| 2 | -15 | 11 | -1 | -7 | 4 | 2 | -2 | 878 | -226 | 7 | 4 | -3 | -1 | -1 | 13 | -9 | -1 | 6 | -10 |
| 2 | -15 | 12 | 2 | -0 | 4 | 2 | -1 | -145 | 1493 | 7 | 4 | -2 | -1 | -1 | 13 | -9 | 0 | -1 | -24 |
| 2 | -15 | 13 | 1 | 4 | 4 | 2 | 0 | 1105 | 1031 | 7 | 4 | 0 | 1 | 1 | 13 | -9 | 1 | -11 | -4 |
| 2 | -14 | 5 | 1 | -3 | 4 | 2 | 1 | 64 | 97 | 7 | 5 | -9 | -1 | 2 | 13 | -9 | 2 | 0 | 17 |
| 2 | -14 | 7 | 2 | -3 | 4 | 2 | 2 | -9 | 1 | 7 | 5 | -8 | -5 | -4 | 13 | -9 | 3 | 2 | 5 |
| 2 | -14 | 8 | -1 | -1 | 4 | 2 | 3 | -5 | -34 | 7 | 5 | -7 | 1 | -4 | 13 | -8 | -1 | 4 | 6 |
| 2 | -14 | 9 | -9 | 7 | 4 | 2 | 4 | 1 | -11 | 7 | 5 | -6 | -2 | -3 | 13 | -8 | 0 | -13 | 2 |
| 2 | -14 | 10 | -13 | -16 | 4 | 2 | 5 | 3 | 6 | 7 | 5 | -5 | -0 | 2 | 13 | -8 | 1 | -27 | -4 |
| 2 | -14 | 11 | 8 | -15 | 4 | 2 | 6 | 1 | 3 | 7 | 5 | -4 | -2 | 0 | 13 | -8 | 2 | 8 | -2 |
| 2 | -14 | 12 | 9 | 7 | 4 | 3 | -10 | 0 | 2 | 8 | -16 | 0 | -1 | 1 | 13 | -8 | 3 | 7 | -0 |
| 2 | -14 | 13 | 0 | 7 | 4 | 3 | -9 | -3 | 6 | 8 | -16 | 1 | -15 | 8 | 13 | -7 | -1 | -6 | 2 |
| 2 | -13 | 4 | -4 | -0 | 4 | 3 | -8 | -14 | 38 | 8 | -16 | 3 | 15 | -8 | 13 | -7 | 0 | 5 | -1 |
| 2 | -13 | 5 | -8 | -6 | 4 | 3 | -7 | -7 | -45 | 8 | -16 | 4 | 1 | -1 | 13 | -7 | 1 | 6 | -2 |
| 2 | -13 | 6 | 7 | -7 | 4 | 3 | -6 | 21 | 17 | 8 | -15 | 1 | 0 | -4 | 13 | -7 | 2 | -5 | 1 |
| 2 | -13 | 7 | 28 | 25 | 4 | 3 | -5 | -20 | -10 | 8 | -15 | 3 | -0 | 4 | 13 | -6 | -2 | -0 | 2 |
| 2 | -13 | 8 | 10 | 6 | 4 | 3 | -4 | -76 | -299 | 8 | -14 | 2 | -2 | 4 | 13 | -6 | -1 | -5 | 25 |
| 2 | -13 | 9 | -7 | 11 | 4 | 3 | -3 | 371 | -243 | 8 | -14 | 3 | -5 | 2 | 13 | -6 | 1 | 5 | -25 |
| 2 | -13 | 10 | -9 | 39 | 4 | 3 | -2 | 34 | 38 | 8 | -14 | 4 | 1 | -5 | 13 | -6 | 2 | 0 | -2 |
| 2 | -13 | 11 | -36 | -13 | 4 | 3 | -1 | -208 | 211 | 8 | -14 | 5 | 4 | -2 | 13 | -5 | -3 | -1 | -0 |
| 2 | -13 | 12 | 8 | 2 | 4 | 3 | 0 | 158 | 162 | 8 | -14 | 6 | -0 | 4 | 13 | -5 | -2 | 7 | 5 |
| 2 | -13 | 13 | 6 | 10 | 4 | 3 | 1 | 17 | 17 | 8 | -14 | 7 | -2 | 1 | 13 | -5 | -1 | -3 | -3 |
| 2 | -12 | 2 | 3 | 2 | 4 | 3 | 2 | 2 | 12 | 8 | -13 | 0 | 7 | -6 | 13 | -5 | 0 | -25 | -14 |
| 2 | -12 | 3 | 0 | -3 | 4 | 3 | 3 | 1 | 9 | 8 | -13 | 1 | -9 | 6 | 13 | -5 | 1 | 1 | 3 |
| 2 | -12 | 4 | -7 | -1 | 4 | 3 | 4 | -1 | 4 | 8 | -13 | 2 | -10 | 27 | 13 | -5 | 2 | 1 | 0 |
| 2 | -12 | 5 | -6 | -4 | 4 | 3 | 5 | 0 | 2 | 8 | -13 | 3 | -9 | -30 | 13 | -4 | -5 | 1 | 1 |
| 2 | -12 | 6 | -5 | -12 | 4 | 4 | -9 | -2 | -5 | 8 | -13 | 4 | 3 | -5 | 13 | -4 | -4 | 13 | 23 |
| 2 | -12 | 7 | 3 | -8 | 4 | 4 | -8 | 41 | 56 | 8 | -13 | 5 | 5 | 15 | 13 | -4 | -3 | -104 | 2 |
| 2 | -12 | 8 | 65 | -12 | 4 | 4 | -7 | -34 | 11 | 8 | -13 | 6 | -5 | 2 | 13 | -4 | -2 | -213 | -25 |
| 2 | -12 | 9 | 58 | 29 | 4 | 4 | -6 | -27 | -29 | 8 | -13 | 7 | -1 | -7 | 13 | -4 | -1 | 184 | -5 |
| 2 | -12 | 10 | -29 | 27 | 4 | 4 | -5 | -50 | -82 | 8 | -12 | 0 | 1 | 8 | 13 | -4 | 0 | 450 | -55 |
| 2 | -12 | 11 | -17 | -9 | 4 | 4 | -4 | 36 | -90 | 8 | -12 | 1 | -126 | 43 | 13 | -4 | 1 | 54 | 10 |

Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -12 | 12 | -11 | -3 | 4 | 4 | -3 | 43 | 31 | 8 | -12 | 2 | 104 | 46 | 13 | -4 | 2 | -0 | 2 |
| 2 | -12 | 13 | 2 | 2 | 4 | 4 | -2 | -29 | -18 | 8 | -12 | 3 | 60 | 29 | 13 | -4 | 3 | -3 | -2 |
| 2 | -11 | 2 | -0 | -2 | 4 | 4 | -1 | -31 | 15 | 8 | -12 | 4 | -40 | -28 | 13 | -3 | -4 | 0 | -1 |
| 2 | -11 | 3 | 2 | 9 | 4 | 4 | 0 | 48 | 67 | 8 | -12 | 5 | -3 | -30 | 13 | -3 | -3 | 0 | 1 |
| 2 | -11 | 4 | -12 | 15 | 4 | 4 | 1 | 4 | 1 | 8 | -12 | 6 | 9 | 7 | 13 | -3 | -2 | -0 | 1 |
| 2 | -11 | 5 | -31 | 3 | 4 | 4 | 2 | -5 | 0 | 8 | -12 | 7 | -4 | -2 | 13 | -3 | -1 | -4 | 1 |
| 2 | -11 | 6 | -1 | -49 | 4 | 5 | -11 | 1 | -0 | 8 | -11 | -2 | 4 | 1 | 13 | -2 | -9 | -3 | 1 |
| 2 | -11 | 7 | 41 | -75 | 4 | 5 | -9 | 9 | -7 | 8 | -11 | -1 | 24 | 8 | 13 | -2 | -7 | -26 | 5 |
| 2 | -11 | 8 | 61 | -25 | 4 | 5 | -8 | 8 | 14 | 8 | -11 | 0 | 165 | 83 | 13 | -2 | -6 | -15 | -36 |
| 2 | -11 | 9 | 40 | 8 | 4 | 5 | -7 | -8 | 17 | 8 | -11 | 1 | -1387 | 98 | 13 | -2 | -5 | 27 | 7 |
| 2 | -11 | 10 | 32 | 25 | 4 | 5 | -6 | -35 | -10 | 8 | -11 | 2 | -176 | 162 | 13 | -2 | -4 | -24 | 15 |
| 2 | -11 | 11 | -54 | 9 | 4 | 5 | -5 | -54 | -40 | 8 | -11 | 3 | 428 | -52 | 13 | -2 | -3 | -2 | -20 |
| 2 | -11 | 12 | 4 | 0 | 4 | 5 | -4 | -0 | -32 | 8 | -11 | 4 | 18 | -114 | 13 | -2 | -2 | 41 | -1 |
| 2 | -11 | 13 | -5 | 1 | 4 | 5 | -3 | 10 | 10 | 8 | -11 | 5 | 44 | -15 | 13 | -2 | -1 | -26 | 13 |
| 2 | -10 | 1 | 2 | 1 | 4 | 5 | -2 | -16 | -9 | 8 | -11 | 6 | -4 | 6 | 13 | -2 | 0 | -24 | 18 |
| 2 | -10 | 2 | 10 | -9 | 4 | 5 | -1 | 6 | 4 | 8 | -11 | 7 | 5 | 6 | 13 | -2 | 2 | 3 | -1 |
| 2 | -10 | 3 | 27 | 13 | 4 | 5 | 0 | 21 | 18 | 8 | -11 | 8 | 2 | 4 | 13 | 0 | -2 | 0 | -1 |
| 2 | -10 | 4 | -24 | 84 | 4 | 5 | 1 | 3 | 3 | 8 | -10 | -4 | 1 | 1 | 13 | 0 | 0 | -0 | 1 |
| 2 | -10 | 5 | -190 | 3 | 4 | 6 | -10 | -5 | 5 | 8 | -10 | -3 | 11 | 5 | 13 | 19 | -5 | 1 | -4 |
| 2 | -10 | 6 | -91 | -244 | 4 | 6 | -9 | 13 | -12 | 8 | -10 | -2 | 101 | 49 | 13 | 19 | -3 | -0 | 8 |
| 2 | -10 | 7 | 141 | -156 | 4 | 6 | -8 | 12 | 11 | 8 | -10 | -1 | 937 | 456 | 13 | 19 | -1 | -0 | -3 |
| 2 | -10 | 8 | 58 | -26 | 4 | 6 | -7 | 15 | 21 | 8 | -10 | 0 | 9507 | 4544 | 13 | 20 | -10 | -4 | -4 |
| 2 | -10 | 9 | 33 | -4 | 4 | 6 | -6 | -21 | -6 | 8 | -10 | 1 | -14381 | -3335 | 13 | 20 | -9 | -34 | -32 |
| 2 | -10 | 10 | 22 | -18 | 4 | 6 | -5 | -31 | 2 | 8 | -10 | 2 | -11635 | -4994 | 13 | 20 | -8 | -300 | -281 |
| 2 | -10 | 11 | -51 | 45 | 4 | 6 | -4 | 8 | 4 | 8 | -10 | 3 | 4138 | 664 | 13 | 20 | -7 | -2720 | -2544 |
| 2 | -10 | 12 | -10 | 8 | 4 | 6 | -3 | 11 | 10 | 8 | -10 | 4 | 673 | 89 | 13 | 20 | -6 | -25992 | -24308 |
| 2 | -10 | 13 | -3 | 3 | 4 | 6 | -2 | -3 | 1 | 8 | -10 | 5 | 101 | 15 | 13 | 20 | -5 | -279473 | -261264 |
| 2 | -9 | -2 | 1 | 3 | 4 | 6 | -1 | -1 | -3 | 8 | -10 | 6 | -5 | -10 | 13 | 20 | -4 | 1299 | 1370 |
| 2 | -9 | -1 | 2 | 2 | 4 | 6 | 0 | 2 | -4 | 8 | -10 | 7 | -5 | 1 | 13 | 20 | -3 | 279055 | 260881 |
| 2 | -9 | 0 | 10 | 16 | 4 | 7 | -11 | -0 | 2 | 8 | -10 | 8 | 0 | 1 | 13 | 20 | -2 | 25567 | 23859 |
| 2 | -9 | 1 | 26 | 59 | 4 | 7 | -10 | -3 | 2 | 8 | -9 | -4 | -2 | 4 | 13 | 20 | -1 | 2663 | 2484 |
| 2 | -9 | 2 | 116 | -59 | 4 | 7 | -9 | 1 | -6 | 8 | -9 | -3 | -16 | 27 | 13 | 20 | 0 | 293 | 273 |
| 2 | -9 | 3 | 102 | 225 | 4 | 7 | -8 | 2 | 9 | 8 | -9 | -2 | -151 | 248 | 13 | 20 | 1 | 34 | 32 |
| 2 | -9 | 4 | -500 | 382 | 4 | 7 | -7 | -5 | 6 | 8 | -9 | -1 | -1491 | 2424 | 13 | 20 | 2 | 4 | 4 |
| 2 | -9 | 5 | -761 | -521 | 4 | 7 | -6 | 2 | 16 | 8 | -9 | 0 | -17304 | 28815 | 13 | 21 | -6 | -8 | -1 |
| 2 | -9 | 6 | 111 | -671 | 4 | 7 | -5 | -4 | 3 | 8 | -9 | 1 | -6808 | 19808 | 13 | 21 | -5 | -81 | -13 |
| 2 | -9 | 7 | 78 | -121 | 4 | 7 | -4 | -2 | -3 | 8 | -9 | 2 | 15113 | -25317 | 13 | 21 | -3 | 63 | 10 |
| 2 | -9 | 8 | -4 | 5 | 4 | 8 | -11 | 1 | 2 | 8 | -9 | 3 | 3645 | -8487 | 13 | 21 | -2 | 8 | 1 |
| 2 | -9 | 9 | -10 | -63 | 4 | 8 | -10 | -2 | 2 | 8 | -9 | 4 | 471 | -1096 | 13 | 22 | -5 | -3 | -2 |
| 2 | -9 | 10 | 4 | -8 | 4 | 8 | -9 | -2 | -4 | 8 | -9 | 5 | 16 | -115 | 13 | 22 | -3 | 3 | 2 |
| 2 | -9 | 11 | -3 | 11 | 4 | 8 | -8 | 3 | -3 | 8 | -9 | 6 | -22 | -11 | 14 | -20 | 1 | 4 | -5 |
| 2 | -9 | 12 | -0 | 4 | 4 | 8 | -7 | 2 | 2 | 8 | -9 | 7 | 5 | -1 | 14 | -20 | 2 | 3 | 1 |
| 2 | -8 | -3 | -1 | -1 | 4 | 8 | -6 | -1 | 1 | 8 | -8 | -3 | -0 | -13 | 14 | -20 | 3 | -6 | 7 |
| 2 | -8 | -2 | 9 | 16 | 4 | 11 | -3 | -1 | 0 | 8 | -8 | -2 | -24 | -98 | 14 | -20 | 4 | -1 | -0 |
| 2 | -8 | -1 | 62 | 119 | 4 | 11 | -1 | 1 | -0 | 8 | -8 | -1 | -311 | -806 | 14 | -19 | -1 | 3 | -0 |
| 2 | -8 | 0 | 588 | 1175 | 5 | -16 | 9 | 1 | -4 | 8 | -8 | 0 | -5256 | -6265 | 14 | -19 | 0 | 24 | -2 |
| 2 | -8 | 1 | -528 | 1533 | 5 | -16 | 10 | 3 | 1 | 8 | -8 | 1 | -5742 | -2937 | 14 | -19 | 1 | 238 | -26 |
| 2 | -8 | 2 | 337 | -853 | 5 | -16 | 11 | -4 | 7 | 8 | -8 | 2 | 3866 | 4372 | 14 | -19 | 2 | -24 | 40 |
| 2 | -8 | 3 | -351 | 1449 | 5 | -16 | 12 | -8 | -2 | 8 | -8 | 3 | 1959 | 1409 | 14 | -19 | 3 | -283 | 31 |
| 2 | -8 | 4 | -3462 | 18 | 5 | -16 | 13 | 3 | -3 | 8 | -8 | 4 | 283 | 240 | 14 | -19 | 4 | -15 | -11 |
| 2 | -8 | 5 | -1174 | -2482 | 5 | -16 | 14 | 4 | 1 | 8 | -8 | 5 | -22 | 76 | 14 | -19 | 5 | -3 | 0 |
| 2 | -8 | 6 | -12 | -560 | 5 | -15 | -12 | -1 | -16 | 8 | -8 | 6 | -5 | 23 | 14 | -18 | -2 | 0 | 5 |
| 2 | -8 | 7 | 75 | 11 | 5 | -15 | -11 | 18 | 7 | 8 | -8 | 7 | -4 | 5 | 14 | -18 | -1 | 1 | 46 |
| 2 | -8 | 8 | 21 | -7 | 5 | -15 | -10 | -2 | -0 | 8 | -7 | -4 | 1 | 1 | 14 | -18 | 0 | 14 | 447 |
| 2 | -8 | 9 | -4 | -21 | 5 | -15 | -9 | 21 | 4 | 8 | -7 | -3 | 9 | 2 | 14 | -18 | 1 | 149 | 4885 |
| 2 | -8 | 10 | 36 | 71 | 5 | -15 | -8 | 3 | 27 | 8 | -7 | -2 | 101 | 20 | 14 | -18 | 2 | 41 | -34 |
| 2 | -8 | 11 | 2 | 2 | 5 | -15 | -7 | -2 | 4 | 8 | -7 | -1 | 839 | 54 | 14 | -18 | 3 | -141 | -4638 |
| 2 | -8 | 12 | 1 | 2 | 5 | -15 | 7 | -2 | -0 | 8 | -7 | 0 | 3343 | -2838 | 14 | -18 | 4 | -27 | -436 |
| 2 | -7 | -6 | 1 | 2 | 5 | -15 | 8 | 3 | -13 | 8 | -7 | 1 | 388 | -3320 | 14 | -18 | 5 | -1 | -46 |
| 2 | -7 | -5 | 7 | 15 | 5 | -15 | 9 | 21 | -1 | 8 | -7 | 2 | -1989 | 1093 | 14 | -18 | 6 | -0 | -5 |
| 2 | -7 | -4 | 65 | 130 | 5 | -15 | 10 | 8 | 23 | 8 | -7 | 3 | -606 | 845 | 14 | -17 | 0 | -2 | 5 |
| 2 | -7 | -3 | 570 | 1148 | 5 | -15 | 11 | 6 | 5 | 8 | -7 | 4 | -126 | 187 | 14 | -17 | 1 | -31 | 62 |
| 2 | -7 | -2 | 5176 | 10425 | 5 | -15 | 12 | -19 | -12 | 8 | -7 | 5 | -22 | 58 | 14 | -17 | 3 | 24 | -49 |

# Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -7 | -1 | 49646 | 99918 | 5 | -15 | 13 | 7 | -13 | 8 | -7 | 6 | -3 | 6 | 14 | -17 | 4 | 2 | -5 |
| 2 | -7 | 0 | 540283 | 1084551 | 5 | -15 | 14 | 7 | 3 | 8 | -6 | -4 | 1 | 1 | 14 | -16 | 0 | -2 | 3 |
| 2 | -7 | 1 | 127627 | -62867 | 5 | -14 | 0 | 3 | -1 | 8 | -6 | -3 | 3 | 15 | 14 | -16 | 1 | -22 | 51 |
| 2 | -7 | 2 | -517365 | -1053231 | 5 | -14 | 2 | -16 | 7 | 8 | -6 | -2 | -150 | 68 | 14 | -16 | 3 | 14 | -35 |
| 2 | -7 | 3 | -100692 | -70808 | 5 | -14 | 4 | 1 | -1 | 8 | -6 | -1 | -711 | 495 | 14 | -16 | 4 | 2 | -3 |
| 2 | -7 | 4 | -21124 | -13660 | 5 | -14 | 5 | 7 | 13 | 8 | -6 | 0 | -1396 | -2044 | 14 | -15 | 0 | -5 | -1 |
| 2 | -7 | 5 | -2050 | -2813 | 5 | -14 | 6 | -15 | 12 | 8 | -6 | 1 | -861 | -4469 | 14 | -15 | 1 | -132 | -9 |
| 2 | -7 | 6 | 335 | -111 | 5 | -14 | 7 | -28 | -23 | 8 | -6 | 2 | 892 | 832 | 14 | -15 | 2 | 1 | -4 |
| 2 | -7 | 7 | 184 | 64 | 5 | -14 | 8 | -18 | -17 | 8 | -6 | 3 | 495 | 820 | 14 | -15 | 3 | 68 | 5 |
| 2 | -7 | 8 | -8 | 10 | 5 | -14 | 9 | -26 | -43 | 8 | -6 | 4 | 88 | 177 | 14 | -15 | 4 | 4 | 4 |
| 2 | -7 | 9 | 19 | -1 | 5 | -14 | 10 | 18 | -69 | 8 | -6 | 5 | 14 | 23 | 14 | -14 | -1 | -1 | 1 |
| 2 | -7 | 10 | 8 | 4 | 5 | -14 | 11 | 48 | -9 | 8 | -6 | 6 | 1 | 3 | 14 | -14 | 0 | -2 | 1 |
| 2 | -7 | 11 | 3 | 1 | 5 | -14 | 12 | -9 | -7 | 8 | -5 | -4 | 4 | 5 | 14 | -14 | 1 | 29 | -168 |
| 2 | -6 | -5 | 3 | 4 | 5 | -14 | 13 | -1 | -4 | 8 | -5 | -3 | 1 | -13 | 14 | -14 | 2 | 11 | -17 |
| 2 | -6 | -4 | 7 | 17 | 5 | -14 | 14 | 8 | 1 | 8 | -5 | -2 | -91 | -234 | 14 | -14 | 3 | -11 | 70 |
| 2 | -6 | -3 | 51 | 148 | 5 | -13 | 2 | -1 | 1 | 8 | -5 | -1 | -601 | -853 | 14 | -14 | 4 | -3 | 8 |
| 2 | -6 | -2 | 541 | 1453 | 5 | -13 | 3 | 0 | 7 | 8 | -5 | 0 | 2722 | 1474 | 14 | -13 | -1 | -6 | -10 |
| 2 | -6 | -1 | 5158 | 14495 | 5 | -13 | 4 | 9 | 11 | 8 | -5 | 1 | 1400 | 1116 | 14 | -13 | 0 | -49 | -58 |
| 2 | -6 | 0 | 61533 | 171377 | 5 | -13 | 5 | 8 | -38 | 8 | -5 | 2 | -1087 | -354 | 14 | -13 | 1 | 188 | 77 |
| 2 | -6 | 1 | 138155 | 43745 | 5 | -13 | 6 | -17 | -33 | 8 | -5 | 3 | -264 | -51 | 14 | -13 | 2 | 77 | 83 |
| 2 | -6 | 2 | -55661 | -72103 | 5 | -13 | 7 | -5 | 36 | 8 | -5 | 4 | -31 | -9 | 14 | -13 | 3 | -64 | -21 |
| 2 | -6 | 3 | -91052 | -18634 | 5 | -13 | 8 | -45 | 19 | 8 | -5 | 5 | -5 | 7 | 14 | -13 | 4 | -10 | -4 |
| 2 | -6 | 4 | -11082 | -11848 | 5 | -13 | 9 | -5 | -62 | 8 | -4 | -5 | 0 | -2 | 14 | -12 | -4 | 4 | -2 |
| 2 | -6 | 5 | 2680 | -2529 | 5 | -13 | 10 | 12 | -45 | 8 | -4 | -4 | -3 | 12 | 14 | -12 | -3 | 34 | -17 |
| 2 | -6 | 6 | 975 | -386 | 5 | -13 | 11 | 62 | -19 | 8 | -4 | -3 | -44 | 44 | 14 | -12 | -2 | 309 | -150 |
| 2 | -6 | 7 | 189 | -64 | 5 | -13 | 12 | -10 | 10 | 8 | -4 | -2 | -252 | 127 | 14 | -12 | -1 | 2998 | -1405 |
| 2 | -6 | 8 | 24 | 4 | 5 | -13 | 13 | -20 | 3 | 8 | -4 | -1 | -4112 | 897 | 14 | -12 | 0 | 33551 | -14336 |
| 2 | -6 | 9 | 66 | -10 | 5 | -13 | 14 | -1 | 1 | 8 | -4 | 0 | -482 | -1814 | 14 | -12 | 1 | -1045 | 1594 |
| 2 | -6 | 10 | 3 | -1 | 5 | -12 | 2 | -3 | 3 | 8 | -4 | 1 | 4713 | -1490 | 14 | -12 | 2 | -34005 | 14583 |
| 2 | -6 | 11 | 2 | -0 | 5 | -12 | 3 | -3 | -3 | 8 | -4 | 2 | 420 | 450 | 14 | -12 | 3 | -2651 | 882 |
| 2 | -5 | -5 | -1 | 5 | 5 | -12 | 4 | 1 | -13 | 8 | -4 | 3 | 31 | 89 | 14 | -12 | 4 | -260 | 77 |
| 2 | -5 | -4 | 1 | 55 | 5 | -12 | 5 | 32 | -14 | 8 | -4 | 4 | -6 | 41 | 14 | -12 | 5 | -28 | 8 |
| 2 | -5 | -3 | 59 | 513 | 5 | -12 | 6 | 32 | 49 | 8 | -4 | 5 | -0 | 3 | 14 | -12 | 6 | -4 | 2 |
| 2 | -5 | -2 | 520 | 4806 | 5 | -12 | 7 | -57 | 57 | 8 | -3 | -5 | 3 | 6 | 14 | -11 | -2 | -1 | 1 |
| 2 | -5 | -1 | 5089 | 49228 | 5 | -12 | 8 | -61 | -38 | 8 | -3 | -4 | -14 | 23 | 14 | -11 | -1 | -7 | 25 |
| 2 | -5 | 0 | 64932 | 623860 | 5 | -12 | 9 | -1 | -13 | 8 | -3 | -3 | -85 | 131 | 14 | -11 | 0 | 8 | 114 |
| 2 | -5 | 1 | 332245 | 560027 | 5 | -12 | 10 | -12 | 3 | 8 | -3 | -2 | -656 | 885 | 14 | -11 | 1 | 45 | 3 |
| 2 | -5 | 2 | -217055 | -209168 | 5 | -12 | 11 | 52 | -61 | 8 | -3 | -1 | 404 | -523 | 14 | -11 | 2 | -4 | -97 |
| 2 | -5 | 3 | -106312 | -170429 | 5 | -12 | 12 | 11 | -2 | 8 | -3 | 0 | 2114 | -2891 | 14 | -11 | 3 | -10 | -23 |
| 2 | -5 | 4 | 8472 | -48821 | 5 | -12 | 13 | 1 | -3 | 8 | -3 | 1 | -292 | 394 | 14 | -11 | 4 | -1 | -2 |
| 2 | -5 | 5 | 3930 | -8762 | 5 | -12 | 14 | -3 | 8 | 8 | -3 | 2 | -63 | 73 | 14 | -10 | -1 | -4 | -4 |
| 2 | -5 | 6 | 738 | -1296 | 5 | -12 | 15 | -1 | 2 | 8 | -3 | 3 | -10 | 7 | 14 | -10 | 0 | -15 | -9 |
| 2 | -5 | 7 | 114 | -164 | 5 | -11 | 0 | -2 | -2 | 8 | -3 | 4 | 2 | -3 | 14 | -10 | 1 | 4 | 4 |
| 2 | -5 | 8 | -4 | -15 | 5 | -11 | 1 | -2 | -6 | 8 | -3 | 5 | -1 | -3 | 14 | -10 | 2 | 11 | 6 |
| 2 | -5 | 9 | 22 | -10 | 5 | -11 | 2 | -23 | 7 | 8 | -2 | -9 | -0 | 3 | 14 | -9 | -1 | 2 | 0 |
| 2 | -5 | 10 | 3 | -2 | 5 | -11 | 3 | -25 | -34 | 8 | -2 | -8 | -2 | 1 | 14 | -9 | 1 | -2 | -0 |
| 2 | -5 | 11 | 1 | -1 | 5 | -11 | 4 | 59 | -88 | 8 | -2 | -7 | -5 | 20 | 14 | -8 | -1 | -0 | 2 |
| 2 | -4 | -8 | -2 | 1 | 5 | -11 | 5 | 183 | 55 | 8 | -2 | -6 | -89 | -19 | 14 | -8 | 1 | 0 | -2 |
| 2 | -4 | -7 | 8 | -3 | 5 | -11 | 6 | -25 | 267 | 8 | -2 | -5 | -596 | -218 | 14 | -7 | -1 | -6 | -1 |
| 2 | -4 | -6 | 15 | 0 | 5 | -11 | 7 | -240 | 7 | 8 | -2 | -4 | -3685 | -3392 | 14 | -7 | 1 | 6 | 1 |
| 2 | -4 | -5 | -19 | 21 | 5 | -11 | 8 | -40 | -143 | 8 | -2 | -3 | -13779 | -38040 | 14 | -6 | -2 | -5 | 2 |
| 2 | -4 | -4 | -66 | 184 | 5 | -11 | 9 | -11 | -12 | 8 | -2 | -2 | -35746 | -131217 | 14 | -6 | -1 | -1 | -1 |
| 2 | -4 | -3 | -309 | 1685 | 5 | -11 | 10 | -10 | -2 | 8 | -2 | -1 | 37597 | 123420 | 14 | -6 | 0 | 32 | -13 |
| 2 | -4 | -2 | -3231 | 15755 | 5 | -11 | 11 | 11 | -60 | 8 | -2 | 0 | 130111 | 273022 | 14 | -6 | 1 | 1 | 1 |
| 2 | -4 | -1 | -35810 | 167802 | 5 | -11 | 12 | 14 | 41 | 8 | -2 | 1 | 11498 | 20164 | 14 | -6 | 2 | -5 | 2 |
| 2 | -4 | 0 | -502595 | 2259623 | 5 | -11 | 13 | 1 | 1 | 8 | -2 | 2 | 1037 | 1757 | 14 | -5 | -3 | -0 | -2 |
| 2 | -4 | 1 | -320714 | 2474882 | 5 | -11 | 14 | 1 | 1 | 8 | -2 | 3 | 107 | 181 | 14 | -5 | -1 | 0 | 2 |
| 2 | -4 | 2 | 239040 | -1099043 | 5 | -10 | -1 | -6 | -5 | 8 | -2 | 4 | 19 | 21 | 14 | -4 | -5 | -4 | 8 |
| 2 | -4 | 3 | 102712 | -688484 | 5 | -10 | 0 | -30 | -49 | 8 | -2 | 5 | 2 | 2 | 14 | -4 | -4 | 6 | 11 |
| 2 | -4 | 4 | 18904 | -115087 | 5 | -10 | 1 | 81 | -116 | 8 | -1 | -8 | 3 | 1 | 14 | -4 | -3 | -13 | -13 |
| 2 | -4 | 5 | 2733 | -15847 | 5 | -10 | 2 | -159 | -6 | 8 | -1 | -7 | 6 | -5 | 14 | -4 | -2 | -41 | -29 |
| 2 | -4 | 6 | 370 | -2021 | 5 | -10 | 3 | -66 | -298 | 8 | -1 | -6 | 48 | -19 | 14 | -4 | -1 | 35 | 26 |
| 2 | -4 | 7 | 53 | -267 | 5 | -10 | 4 | 625 | -236 | 8 | -1 | -5 | 15 | 43 | 14 | -4 | 0 | 60 | 10 |

# Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -4 | 8 | 9 | -54 | 5 | -10 | 5 | 577 | 809 | 8 | -1 | -4 | -121 | -11 | 14 | -4 | 1 | 7 | -4 |
| 2 | -4 | 9 | 1 | -9 | 5 | -10 | 6 | -737 | 633 | 8 | -1 | -3 | -37 | -92 | 14 | -4 | 2 | 2 | -1 |
| 2 | -4 | 10 | 0 | -1 | 5 | -10 | 7 | -360 | -335 | 8 | -1 | -2 | -112 | 111 | 14 | -2 | -8 | -6 | -9 |
| 2 | -3 | -8 | 8 | 2 | 5 | -10 | 8 | -42 | -99 | 8 | -1 | -1 | 267 | -10 | 14 | -2 | -7 | -5 | 6 |
| 2 | -3 | -6 | 25 | -12 | 5 | -10 | 9 | 42 | 39 | 8 | -1 | 0 | 404 | -49 | 14 | -2 | -6 | 10 | 1 |
| 2 | -3 | -5 | -21 | -7 | 5 | -10 | 10 | -17 | -4 | 8 | -1 | 1 | 54 | 5 | 14 | -2 | -5 | 14 | 1 |
| 2 | -3 | -4 | 27 | -48 | 5 | -10 | 11 | -7 | -16 | 8 | -1 | 3 | -7 | -1 | 14 | -2 | -4 | -5 | 6 |
| 2 | -3 | -3 | 849 | -585 | 5 | -10 | 12 | 7 | 2 | 8 | 0 | -7 | 3 | 1 | 14 | -2 | -3 | 7 | 6 |
| 2 | -3 | -2 | 6746 | -5641 | 5 | -10 | 13 | 3 | 2 | 8 | 0 | -6 | -2 | -2 | 14 | -2 | -2 | -8 | -3 |
| 2 | -3 | -1 | 43543 | -63695 | 5 | -10 | 14 | 1 | 1 | 8 | 0 | -5 | -4 | 13 | 14 | -2 | -1 | 5 | -0 |
| 2 | -3 | 0 | -484931 | -437132 | 5 | -9 | -3 | -3 | -4 | 8 | 0 | -4 | 16 | 33 | 14 | 19 | -6 | 0 | -2 |
| 2 | -3 | 1 | 53311 | 661539 | 5 | -9 | -2 | -24 | -35 | 8 | 0 | -3 | -31 | -35 | 14 | 19 | -5 | 4 | -18 |
| 2 | -3 | 2 | 229406 | 236845 | 5 | -9 | -1 | -238 | -365 | 8 | 0 | -2 | -16 | -82 | 14 | 19 | -3 | -3 | 16 |
| 2 | -3 | 3 | -3010 | -91962 | 5 | -9 | 0 | -2333 | -3668 | 8 | 0 | -1 | 113 | 90 | 14 | 19 | -2 | -0 | 2 |
| 2 | -3 | 4 | -2148 | -17151 | 5 | -9 | 1 | 3530 | -1583 | 8 | 0 | 0 | 145 | 29 | 14 | 19 | -1 | 2 | -6 |
| 2 | -3 | 5 | -327 | -2421 | 5 | -9 | 2 | 1741 | 2948 | 8 | 0 | 1 | 8 | 4 | 14 | 19 | 1 | 1 | -2 |
| 2 | -3 | 6 | -88 | -325 | 5 | -9 | 3 | 0 | -1218 | 8 | 0 | 2 | -4 | 3 | 14 | 20 | -7 | -1 | -4 |
| 2 | -3 | 7 | 4 | -22 | 5 | -9 | 4 | 3314 | 1153 | 8 | 0 | 3 | -1 | -0 | 14 | 20 | -6 | -9 | -32 |
| 2 | -3 | 8 | 17 | -21 | 5 | -9 | 5 | -562 | 3655 | 8 | 1 | -7 | -4 | 2 | 14 | 20 | -5 | -82 | -286 |
| 2 | -3 | 9 | -7 | -6 | 5 | -9 | 6 | -1828 | -286 | 8 | 1 | -6 | 9 | -14 | 14 | 20 | -4 | 15 | 64 |
| 2 | -3 | 10 | -3 | 1 | 5 | -9 | 7 | -301 | -212 | 8 | 1 | -5 | 3 | 9 | 14 | 20 | -3 | 76 | 264 |
| 2 | -3 | 11 | 1 | 0 | 5 | -9 | 8 | 22 | -5 | 8 | 1 | -4 | -21 | 21 | 14 | 20 | -2 | 2 | 6 |
| 2 | -2 | -10 | -4 | -2 | 5 | -9 | 9 | 4 | -3 | 8 | 1 | -3 | -8 | -9 | 14 | 20 | -1 | 0 | 1 |
| 2 | -2 | -9 | 2 | -2 | 5 | -9 | 10 | -27 | 21 | 8 | 1 | -2 | 28 | -9 | 14 | 21 | -6 | -6 | -5 |
| 2 | -2 | -8 | -3 | -6 | 5 | -9 | 11 | 28 | 7 | 8 | 1 | -1 | 3 | 32 | 14 | 21 | -5 | -65 | -52 |
| 2 | -2 | -7 | -14 | -6 | 5 | -9 | 12 | 5 | 1 | 8 | 1 | 0 | 16 | 13 | 14 | 21 | -4 | 2 | 2 |
| 2 | -2 | -6 | 29 | 16 | 5 | -9 | 13 | 4 | -0 | 8 | 1 | 1 | 1 | -2 | 14 | 21 | -3 | 45 | 37 |
| 2 | -2 | -5 | 327 | 143 | 5 | -8 | -5 | -1 | -3 | 8 | 1 | 2 | -0 | -1 | 14 | 21 | -2 | 6 | 5 |
| 2 | -2 | -4 | 2584 | 1130 | 5 | -8 | -4 | -13 | -23 | 8 | 2 | -7 | -3 | 0 | 14 | 22 | -6 | -3 | -0 |
| 2 | -2 | -3 | 21757 | 9828 | 5 | -8 | -3 | -120 | -213 | 8 | 2 | -6 | 2 | 0 | 14 | 22 | -5 | -3 | -8 |
| 2 | -2 | -2 | 188668 | 81095 | 5 | -8 | -2 | -1097 | -1953 | 8 | 2 | -4 | -9 | -0 | 14 | 22 | -4 | 6 | 0 |
| 2 | -2 | -1 | 1589543 | 577817 | 5 | -8 | -1 | -10602 | -18845 | 8 | 2 | -3 | 5 | 2 | 14 | 22 | -3 | 2 | 5 |
| 2 | -2 | 0 | 343936 | -722662 | 5 | -8 | 0 | -117882 | -208662 | 8 | 2 | -2 | 4 | 9 | 14 | 25 | -6 | 2 | -2 |
| 2 | -2 | 1 | -1662984 | -919605 | 5 | -8 | 1 | -81092 | -8024 | 8 | 2 | -1 | 10 | 0 | 14 | 25 | -4 | -2 | 2 |
| 2 | -2 | 2 | -340298 | 213512 | 5 | -8 | 2 | 104029 | 184116 | 8 | 2 | 0 | 1 | 1 | 14 | 26 | -6 | 3 | -3 |
| 2 | -2 | 3 | -80030 | 59218 | 5 | -8 | 3 | 47390 | 15519 | 8 | 2 | 1 | -2 | 0 | 14 | 26 | -4 | -3 | 3 |
| 2 | -2 | 4 | -11168 | 6466 | 5 | -8 | 4 | 12200 | 15080 | 8 | 3 | -8 | 1 | 2 | 15 | -25 | 2 | -1 | -2 |
| 2 | -2 | 5 | -1371 | 635 | 5 | -8 | 5 | -6169 | 3704 | 8 | 3 | -7 | -2 | -1 | 15 | -25 | 4 | 1 | 2 |
| 2 | -2 | 6 | -117 | 112 | 5 | -8 | 6 | -1203 | -22 | 8 | 3 | -6 | -1 | -3 | 15 | -20 | 0 | 4 | -1 |
| 2 | -2 | 7 | -32 | 12 | 5 | -8 | 7 | 54 | -155 | 8 | 3 | -5 | 3 | 2 | 15 | -20 | 1 | 29 | -5 |
| 2 | -2 | 8 | -7 | -4 | 5 | -8 | 8 | 42 | -37 | 8 | 3 | -4 | 0 | 2 | 15 | -20 | 2 | 30 | 51 |
| 2 | -2 | 9 | -23 | -7 | 5 | -8 | 9 | -40 | 1 | 8 | 3 | -3 | 5 | -3 | 15 | -20 | 3 | -40 | 7 |
| 2 | -2 | 10 | -29 | -12 | 5 | -8 | 10 | -8 | 5 | 8 | 3 | -2 | -38 | -37 | 15 | -20 | 4 | -15 | -19 |
| 2 | -2 | 11 | -3 | -2 | 5 | -8 | 11 | 14 | -8 | 8 | 3 | -1 | -6 | 3 | 15 | -19 | -2 | 4 | 2 |
| 2 | -2 | 12 | 8 | 3 | 5 | -8 | 12 | 2 | -2 | 8 | 3 | 0 | 38 | 37 | 15 | -19 | -1 | 35 | 16 |
| 2 | -1 | -11 | 5 | -0 | 5 | -8 | 13 | 1 | -1 | 8 | 3 | 1 | 1 | 5 | 15 | -19 | 0 | 325 | 151 |
| 2 | -1 | -10 | 4 | -1 | 5 | -7 | -5 | -0 | -1 | 8 | 4 | -7 | -2 | 3 | 15 | -19 | 1 | 3408 | 1582 |
| 2 | -1 | -9 | -3 | 8 | 5 | -7 | -4 | -5 | -14 | 8 | 4 | -6 | 1 | -1 | 15 | -19 | 2 | -44 | 125 |
| 2 | -1 | -8 | 12 | 9 | 5 | -7 | -3 | -37 | -130 | 8 | 4 | -5 | -2 | 3 | 15 | -19 | 3 | -3681 | -1702 |
| 2 | -1 | -7 | -8 | 21 | 5 | -7 | -2 | -349 | -1204 | 8 | 4 | -4 | -1 | 1 | 15 | -19 | 4 | -311 | -191 |
| 2 | -1 | -6 | -231 | 71 | 5 | -7 | -1 | -3469 | -12037 | 8 | 22 | -8 | 0 | 3 | 15 | -19 | 5 | -31 | -21 |
| 2 | -1 | -5 | -1881 | 611 | 5 | -7 | 0 | -41823 | -145240 | 8 | 22 | -7 | 3 | 28 | 15 | -19 | 6 | -4 | -2 |
| 2 | -1 | -4 | -15338 | 5164 | 5 | -7 | 1 | -129498 | -84918 | 8 | 22 | -6 | 32 | 268 | 15 | -18 | -1 | 1 | 8 |
| 2 | -1 | -3 | -121685 | 41746 | 5 | -7 | 2 | 49088 | 54482 | 8 | 22 | -5 | 339 | 2879 | 15 | -18 | 0 | 6 | 83 |
| 2 | -1 | -2 | -834594 | 303091 | 5 | -7 | 3 | 91554 | 50166 | 8 | 22 | -3 | -340 | -2882 | 15 | -18 | 1 | 66 | 922 |
| 2 | -1 | -1 | 1153563 | 327951 | 5 | -7 | 4 | -10646 | 34878 | 8 | 22 | -2 | -32 | -268 | 15 | -18 | 2 | -1 | -12 |
| 2 | -1 | 0 | 3072674 | -883839 | 5 | -7 | 5 | -4899 | 3007 | 8 | 22 | -1 | -3 | -28 | 15 | -18 | 3 | -58 | -810 |
| 2 | -1 | 1 | -1057293 | -378259 | 5 | -7 | 6 | -255 | -953 | 8 | 22 | 0 | -0 | -3 | 15 | -18 | 4 | -6 | -79 |
| 2 | -1 | 2 | -144237 | -22705 | 5 | -7 | 7 | 71 | -326 | 9 | -17 | 1 | 1 | 1 | 15 | -18 | 5 | -1 | -8 |
| 2 | -1 | 3 | -16630 | -1964 | 5 | -7 | 8 | 25 | -62 | 9 | -17 | 3 | -1 | -1 | 15 | -17 | 0 | 2 | 3 |
| 2 | -1 | 4 | -1949 | -227 | 5 | -7 | 9 | 20 | -21 | 9 | -16 | 0 | -2 | 0 | 15 | -17 | 1 | 26 | 36 |
| 2 | -1 | 5 | -282 | 26 | 5 | -7 | 10 | 9 | -20 | 9 | -16 | 1 | -28 | 2 | 15 | -17 | 3 | -19 | -27 |
| 2 | -1 | 6 | -17 | 1 | 5 | -7 | 11 | -2 | -1 | 9 | -16 | 3 | 28 | -2 | 15 | -17 | 4 | -2 | -3 |

# Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -1 | 7 | 27 | -15 | 5 | -7 | 12 | -1 | -3 | 9 | -16 | 4 | 2 | -0 | 15 | -16 | 0 | -2 | 3 |
| 2 | -1 | 8 | 24 | -17 | 5 | -6 | -5 | 0 | -6 | 9 | -15 | 1 | 0 | -2 | 15 | -16 | 1 | -26 | 58 |
| 2 | -1 | 9 | -5 | 5 | 5 | -6 | -4 | 4 | -38 | 9 | -15 | 2 | 1 | 0 | 15 | -16 | 2 | 1 | -2 |
| 2 | -1 | 10 | -4 | 3 | 5 | -6 | -3 | 58 | -362 | 9 | -15 | 3 | -0 | 2 | 15 | -16 | 3 | 16 | -37 |
| 2 | 0 | -9 | -3 | 6 | 5 | -6 | -2 | 552 | -3374 | 9 | -15 | 4 | -1 | -0 | 15 | -16 | 4 | 2 | -3 |
| 2 | 0 | -8 | -1 | -4 | 5 | -6 | -1 | 5760 | -34895 | 9 | -14 | 1 | 3 | 8 | 15 | -15 | 0 | -2 | 1 |
| 2 | 0 | -7 | 14 | -20 | 5 | -6 | 0 | 78186 | -452445 | 9 | -14 | 2 | 2 | 5 | 15 | -15 | 1 | -83 | -32 |
| 2 | 0 | -6 | 84 | -127 | 5 | -6 | 1 | -200039 | -480008 | 9 | -14 | 3 | -8 | -5 | 15 | -15 | 2 | -3 | -5 |
| 2 | 0 | -5 | 308 | -532 | 5 | -6 | 2 | 187841 | 153019 | 9 | -14 | 4 | -4 | -4 | 15 | -15 | 3 | 39 | 15 |
| 2 | 0 | -4 | 2441 | -3188 | 5 | -6 | 3 | 54341 | 265392 | 9 | -14 | 5 | 4 | -0 | 15 | -15 | 4 | 4 | 1 |
| 2 | 0 | -3 | 15032 | -19856 | 5 | -6 | 4 | -20822 | 43364 | 9 | -14 | 6 | 3 | 3 | 15 | -14 | -1 | -2 | 1 |
| 2 | 0 | -2 | 34915 | -43037 | 5 | -6 | 5 | -5398 | -2441 | 9 | -14 | 7 | -2 | 0 | 15 | -14 | 0 | -10 | 5 |
| 2 | 0 | -1 | -52627 | 95771 | 5 | -6 | 6 | -962 | -1409 | 9 | -13 | -1 | 7 | 0 | 15 | -14 | 1 | 49 | -73 |
| 2 | 0 | 0 | -98249 | 127159 | 5 | -6 | 7 | -104 | -300 | 9 | -13 | 0 | 7 | -2 | 15 | -14 | 2 | 21 | -14 |
| 2 | 0 | 1 | -10208 | -7746 | 5 | -6 | 8 | 5 | -79 | 9 | -13 | 1 | -6 | 47 | 15 | -14 | 3 | -17 | 28 |
| 2 | 0 | 2 | -1241 | -616 | 5 | -6 | 9 | -7 | 7 | 9 | -13 | 2 | 31 | -37 | 15 | -14 | 4 | -2 | 3 |
| 2 | 0 | 3 | -178 | 27 | 5 | -6 | 10 | -6 | -9 | 9 | -13 | 3 | 15 | -36 | 15 | -13 | -2 | -2 | -1 |
| 2 | 0 | 4 | -20 | 6 | 5 | -6 | 11 | -1 | -1 | 9 | -13 | 4 | -6 | 7 | 15 | -13 | -1 | -7 | -4 |
| 2 | 0 | 5 | 13 | -20 | 5 | -5 | -6 | -1 | -1 | 9 | -13 | 5 | -8 | 8 | 15 | -13 | 0 | -22 | -109 |
| 2 | 0 | 6 | 4 | -8 | 5 | -5 | -5 | 7 | -17 | 9 | -13 | 6 | -9 | 7 | 15 | -13 | 1 | 84 | 61 |
| 2 | 1 | -13 | -0 | -1 | 5 | -5 | -4 | 74 | -126 | 9 | -13 | 7 | 0 | -2 | 15 | -13 | 2 | 30 | 131 |
| 2 | 1 | -11 | 3 | 13 | 5 | -5 | -3 | 713 | -1176 | 9 | -12 | -1 | 1 | -2 | 15 | -13 | 3 | -22 | -19 |
| 2 | 1 | -10 | -1 | -11 | 5 | -5 | -2 | 6921 | -11107 | 9 | -12 | 0 | 14 | -0 | 15 | -13 | 4 | -2 | -1 |
| 2 | 1 | -9 | 21 | 36 | 5 | -5 | -1 | 76080 | -119530 | 9 | -12 | 1 | -131 | 556 | 15 | -12 | -2 | 4 | 2 |
| 2 | 1 | -8 | 17 | -3 | 5 | -5 | 0 | 1103863 | -1659834 | 9 | -12 | 2 | 118 | 0 | 15 | -12 | -1 | 42 | 20 |
| 2 | 1 | -7 | -14 | -93 | 5 | -5 | 1 | 705406 | -2138971 | 9 | -12 | 3 | 54 | -208 | 15 | -12 | 0 | 381 | 50 |
| 2 | 1 | -6 | 50 | -438 | 5 | -5 | 2 | -172814 | 1284554 | 9 | -12 | 4 | -46 | -10 | 15 | -12 | 1 | 85 | -82 |
| 2 | 1 | -5 | 569 | -3101 | 5 | -5 | 3 | -205706 | 575193 | 9 | -12 | 5 | -6 | -18 | 15 | -12 | 2 | -352 | -50 |
| 2 | 1 | -4 | 4498 | -19936 | 5 | -5 | 4 | -76527 | 37566 | 9 | -12 | 7 | 2 | 1 | 15 | -12 | 3 | -71 | 8 |
| 2 | 1 | -3 | 27348 | -106005 | 5 | -5 | 5 | -13877 | 1033 | 9 | -11 | -2 | 4 | -3 | 15 | -12 | 4 | -8 | 1 |
| 2 | 1 | -2 | 55914 | -229814 | 5 | -5 | 6 | -2058 | -162 | 9 | -11 | -1 | 44 | -51 | 15 | -11 | -1 | -1 | -1 |
| 2 | 1 | -1 | -103844 | 369360 | 5 | -5 | 7 | -280 | -85 | 9 | -11 | 0 | 422 | -446 | 15 | -11 | 0 | -9 | 13 |
| 2 | 1 | 0 | -141288 | 595762 | 5 | -5 | 8 | -57 | -53 | 9 | -11 | 1 | -1552 | 2952 | 15 | -11 | 1 | -8 | 17 |
| 2 | 1 | 1 | -11246 | 43636 | 5 | -5 | 9 | -18 | 11 | 9 | -11 | 2 | -547 | 964 | 15 | -11 | 2 | 7 | -10 |
| 2 | 1 | 2 | -1052 | 3887 | 5 | -5 | 10 | -3 | -3 | 9 | -11 | 3 | 500 | -1058 | 15 | -11 | 3 | 3 | -5 |
| 2 | 1 | 3 | -120 | 397 | 5 | -4 | -6 | 5 | 2 | 9 | -11 | 4 | 44 | -224 | 15 | -10 | -1 | -0 | 1 |
| 2 | 1 | 4 | -36 | 46 | 5 | -4 | -5 | 42 | 16 | 9 | -11 | 5 | 28 | -21 | 15 | -10 | 0 | -1 | 0 |
| 2 | 1 | 5 | 26 | 19 | 5 | -4 | -4 | 380 | 169 | 9 | -11 | 6 | -4 | -2 | 15 | -10 | 1 | 0 | -1 |
| 2 | 1 | 6 | 16 | -24 | 5 | -4 | -3 | 3553 | 1590 | 9 | -11 | 7 | -3 | 3 | 15 | -10 | 2 | 1 | -0 |
| 2 | 1 | 7 | 5 | 9 | 5 | -4 | -2 | 35224 | 15698 | 9 | -10 | -5 | 7 | 7 | 15 | -9 | -1 | 1 | 1 |
| 2 | 1 | 8 | -1 | 6 | 5 | -4 | -1 | 410719 | 182991 | 9 | -10 | -4 | 64 | 60 | 15 | -9 | 0 | -6 | 4 |
| 2 | 2 | -13 | -3 | -3 | 5 | -4 | 0 | 6441960 | 2187950 | 9 | -10 | -3 | 558 | 515 | 15 | -9 | 1 | 5 | -10 |
| 2 | 2 | -12 | -6 | -5 | 5 | -4 | 1 | 4213501 | 717128 | 9 | -10 | -2 | 5047 | 4658 | 15 | -9 | 2 | 4 | -3 |
| 2 | 2 | -11 | 13 | 12 | 5 | -4 | 2 | -2802428 | -992437 | 9 | -10 | -1 | 48019 | 44346 | 15 | -9 | 3 | -3 | 4 |
| 2 | 2 | -10 | -6 | 9 | 5 | -4 | 3 | -1171319 | -274836 | 9 | -10 | 0 | 509463 | 471310 | 15 | -8 | -1 | -1 | 1 |
| 2 | 2 | -9 | 15 | 8 | 5 | -4 | 4 | -182548 | -39597 | 9 | -10 | 1 | -70098 | -42358 | 15 | -8 | 0 | -2 | -5 |
| 2 | 2 | -8 | 14 | -27 | 5 | -4 | 5 | -24431 | -5084 | 9 | -10 | 2 | -520520 | -480272 | 15 | -8 | 1 | 13 | 14 |
| 2 | 2 | -7 | -80 | -11 | 5 | -4 | 6 | -3136 | -635 | 9 | -10 | 3 | -24808 | -30376 | 15 | -8 | 2 | 2 | 5 |
| 2 | 2 | -6 | 12 | -256 | 5 | -4 | 7 | -398 | -70 | 9 | -10 | 4 | -1760 | -2690 | 15 | -8 | 3 | -4 | -5 |
| 2 | 2 | -5 | 281 | -1398 | 5 | -4 | 8 | -42 | -19 | 9 | -10 | 5 | -165 | -260 | 15 | -7 | -2 | 1 | 1 |
| 2 | 2 | -4 | 2279 | -6891 | 5 | -4 | 9 | -9 | -2 | 9 | -10 | 6 | -13 | -39 | 15 | -7 | -1 | 11 | 14 |
| 2 | 2 | -3 | 23096 | -11062 | 5 | -3 | -7 | -4 | -0 | 9 | -10 | 7 | -2 | -2 | 15 | -7 | 0 | 3 | 1 |
| 2 | 2 | -2 | 46256 | 4786 | 5 | -3 | -6 | -46 | -4 | 9 | -9 | -3 | -7 | 1 | 15 | -7 | 1 | -11 | -14 |
| 2 | 2 | -1 | -65676 | 59900 | 5 | -3 | -5 | -298 | -72 | 9 | -9 | -2 | -71 | 18 | 15 | -7 | 2 | -4 | -2 |
| 2 | 2 | 0 | -47439 | 105319 | 5 | -3 | -4 | -2586 | -590 | 9 | -9 | -1 | -736 | 197 | 15 | -6 | -3 | 5 | 1 |
| 2 | 2 | 1 | -3546 | 7904 | 5 | -3 | -3 | -22414 | -5432 | 9 | -9 | 0 | -6631 | 3635 | 15 | -6 | -2 | 33 | 4 |
| 2 | 2 | 2 | -315 | 767 | 5 | -3 | -2 | -199843 | -43827 | 9 | -9 | 1 | -3340 | 3893 | 15 | -6 | -1 | -32 | 3 |
| 2 | 2 | 3 | -38 | 92 | 5 | -3 | -1 | -1812868 | -271839 | 9 | -9 | 2 | 5378 | -2958 | 15 | -6 | 0 | -97 | 3 |
| 2 | 2 | 4 | 7 | 9 | 5 | -3 | 0 | -3147226 | 1621935 | 9 | -9 | 3 | 1665 | -1298 | 15 | -6 | 1 | 27 | -3 |
| 2 | 2 | 5 | 44 | 18 | 5 | -3 | 1 | 1881024 | 418377 | 9 | -9 | 4 | 207 | -160 | 15 | -6 | 2 | -1 | -5 |
| 2 | 2 | 6 | -7 | -5 | 5 | -3 | 2 | 1431230 | -576744 | 9 | -9 | 5 | 14 | -46 | 15 | -5 | -2 | 0 | -2 |
| 2 | 2 | 7 | 5 | 7 | 5 | -3 | 3 | 190329 | -76603 | 9 | -9 | 6 | 12 | 1 | 15 | -5 | -1 | -2 | -3 |
| 2 | 2 | 9 | 2 | 2 | 5 | -3 | 4 | 23209 | -9263 | 9 | -8 | -3 | 3 | -4 | 15 | -5 | 0 | -0 | 2 |

# Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 3 | -12 | 1 | 2 | 5 | -3 | 5 | 2792 | -1126 | 9 | -8 | -2 | 17 | -45 | 15 | -5 | 1 | 2 | 3 |
| 2 | 3 | -11 | 9 | 11 | 5 | -3 | 6 | 322 | -141 | 9 | -8 | -1 | 160 | -416 | 15 | -4 | -5 | -3 | 2 |
| 2 | 3 | -10 | 0 | -25 | 5 | -3 | 7 | 33 | -16 | 9 | -8 | 0 | -256 | -2594 | 15 | -4 | -4 | -1 | -6 |
| 2 | 3 | -9 | -44 | -42 | 5 | -3 | 8 | 5 | -1 | 9 | -8 | 1 | -1141 | -1318 | 15 | -4 | -3 | 8 | 7 |
| 2 | 3 | -8 | -38 | -4 | 5 | -3 | 9 | 0 | -3 | 9 | -8 | 2 | 277 | 1749 | 15 | -4 | -2 | 2 | 9 |
| 2 | 3 | -7 | 14 | -24 | 5 | -2 | -9 | -3 | 2 | 9 | -8 | 3 | 193 | 668 | 15 | -4 | -1 | -15 | -28 |
| 2 | 3 | -6 | -160 | -119 | 5 | -2 | -8 | -26 | 17 | 9 | -8 | 4 | -2 | 97 | 15 | -4 | 0 | -15 | -4 |
| 2 | 3 | -5 | -386 | -656 | 5 | -2 | -7 | -211 | 140 | 9 | -8 | 5 | -16 | 13 | 15 | -4 | 2 | 3 | -1 |
| 2 | 3 | -4 | 3046 | -740 | 5 | -2 | -6 | -1774 | 1127 | 9 | -8 | 6 | -7 | 0 | 15 | -2 | -8 | -3 | -3 |
| 2 | 3 | -3 | 15405 | 6414 | 5 | -2 | -5 | -14618 | 9514 | 9 | -7 | -4 | 2 | -1 | 15 | -2 | -7 | 4 | 1 |
| 2 | 3 | -2 | 3726 | 5948 | 5 | -2 | -4 | -120105 | 78043 | 9 | -7 | -3 | 11 | -4 | 15 | -2 | -6 | -0 | 5 |
| 2 | 3 | -1 | -14221 | 686 | 5 | -2 | -3 | -960933 | 620557 | 9 | -7 | -2 | 42 | 44 | 15 | -2 | -5 | -4 | -3 |
| 2 | 3 | 0 | -10260 | 14198 | 5 | -2 | -2 | -6738285 | 4270305 | 9 | -7 | -1 | 332 | 282 | 15 | -2 | -4 | 3 | -2 |
| 2 | 3 | 1 | -813 | 1117 | 5 | -2 | -1 | 6463858 | -7693945 | 9 | -7 | 0 | 1842 | -222 | 15 | -2 | -3 | -0 | 2 |
| 2 | 3 | 2 | -87 | 83 | 5 | -2 | 0 | 22593766 | -16011036 | 9 | -7 | 1 | 979 | -1018 | 15 | -2 | -2 | -3 | 1 |
| 2 | 3 | 3 | -1 | 27 | 5 | -2 | 1 | -5394440 | 6930099 | 9 | -7 | 2 | -949 | -21 | 15 | -2 | 0 | 16 | -4 |
| 2 | 3 | 4 | -27 | -41 | 5 | -2 | 2 | -678251 | 984426 | 9 | -7 | 3 | -418 | 130 | 15 | -2 | 2 | -3 | 1 |
| 2 | 3 | 5 | -31 | -29 | 5 | -2 | 3 | -77224 | 114979 | 9 | -7 | 4 | -117 | 59 | 15 | 18 | -5 | -0 | -2 |
| 2 | 3 | 7 | 4 | 4 | 5 | -2 | 4 | -8947 | 13324 | 9 | -7 | 5 | -9 | 1 | 15 | 18 | -4 | -0 | 1 |
| 2 | 4 | -11 | -2 | 2 | 5 | -2 | 5 | -1018 | 1565 | 9 | -6 | -4 | -1 | 4 | 15 | 18 | -3 | 0 | 2 |
| 2 | 4 | -10 | -3 | 1 | 5 | -2 | 6 | -123 | 188 | 9 | -6 | -3 | -3 | 12 | 15 | 18 | -2 | 0 | -1 |
| 2 | 4 | -9 | -26 | 0 | 5 | -2 | 7 | -17 | 24 | 9 | -6 | -2 | -85 | -4 | 15 | 19 | -7 | -2 | -3 |
| 2 | 4 | -8 | 33 | 18 | 5 | -2 | 8 | -2 | 3 | 9 | -6 | -1 | -410 | 81 | 15 | 19 | -6 | -15 | -33 |
| 2 | 4 | -7 | -26 | -42 | 5 | -1 | -10 | 3 | 1 | 9 | -6 | 0 | -224 | 79 | 15 | 19 | -5 | -165 | -348 |
| 2 | 4 | -6 | -69 | -119 | 5 | -1 | -9 | 1 | -6 | 9 | -6 | 1 | 562 | -744 | 15 | 19 | -3 | 174 | 357 |
| 2 | 4 | -5 | 576 | -412 | 5 | -1 | -8 | -10 | 12 | 9 | -6 | 2 | 242 | -51 | 15 | 19 | -2 | 15 | 33 |
| 2 | 4 | -4 | 3471 | -228 | 5 | -1 | -7 | 4 | 57 | 9 | -6 | 3 | 39 | 89 | 15 | 19 | -1 | 5 | -6 |
| 2 | 4 | -3 | 2262 | 3414 | 5 | -1 | -6 | 123 | 426 | 9 | -6 | 4 | 2 | 31 | 15 | 20 | -6 | -6 | -8 |
| 2 | 4 | -2 | 21 | -121 | 5 | -1 | -5 | 827 | 3312 | 9 | -6 | 5 | -0 | 5 | 15 | 20 | -5 | -63 | -88 |
| 2 | 4 | -1 | -1692 | -1425 | 5 | -1 | -4 | 6838 | 26686 | 9 | -5 | -3 | -5 | -4 | 15 | 20 | -4 | -2 | -9 |
| 2 | 4 | 0 | -2169 | 2260 | 5 | -1 | -3 | 58104 | 210113 | 9 | -5 | -2 | 21 | -138 | 15 | 20 | -3 | 53 | 74 |
| 2 | 4 | 1 | -188 | 174 | 5 | -1 | -2 | 431140 | 1439552 | 9 | -5 | -1 | -63 | -827 | 15 | 20 | -2 | 5 | 3 |
| 2 | 4 | 2 | -20 | 37 | 5 | -1 | -1 | 348265 | -164622 | 9 | -5 | 0 | 108 | 538 | 15 | 21 | -6 | -4 | -4 |
| 2 | 4 | 3 | 0 | -4 | 5 | -1 | 0 | -994998 | -3710386 | 9 | -5 | 1 | 130 | 1030 | 15 | 21 | -5 | -47 | -39 |
| 2 | 4 | 4 | 2 | 5 | 5 | -1 | 1 | -365109 | -159538 | 9 | -5 | 2 | -74 | -19 | 15 | 21 | -3 | 29 | 24 |
| 2 | 4 | 5 | 0 | -1 | 5 | -1 | 2 | -38973 | -5875 | 9 | -5 | 3 | -13 | -12 | 15 | 21 | -2 | 4 | 4 |
| 2 | 5 | -11 | -4 | 2 | 5 | -1 | 3 | -4318 | -234 | 9 | -5 | 4 | -0 | -2 | 15 | 22 | -6 | -4 | -0 |
| 2 | 5 | -10 | -11 | 16 | 5 | -1 | 4 | -499 | -7 | 9 | -4 | -5 | -3 | -3 | 15 | 22 | -5 | -3 | -8 |
| 2 | 5 | -9 | -0 | -8 | 5 | -1 | 5 | -56 | -0 | 9 | -4 | -4 | -2 | 0 | 15 | 22 | -4 | 9 | 1 |
| 2 | 5 | -8 | 27 | -7 | 5 | -1 | 6 | -28 | -5 | 9 | -4 | -3 | 41 | 37 | 15 | 22 | -3 | 1 | 4 |
| 2 | 5 | -7 | 17 | -57 | 5 | -1 | 8 | 3 | 1 | 9 | -4 | -2 | 352 | 238 | 15 | 23 | -6 | -2 | -1 |
| 2 | 5 | -6 | 130 | -178 | 5 | 0 | -9 | -3 | -7 | 9 | -4 | -1 | 1263 | 272 | 15 | 23 | -4 | 2 | 1 |
| 2 | 5 | -5 | 607 | -518 | 5 | 0 | -8 | -40 | -9 | 9 | -4 | 0 | -92 | -758 | 15 | 24 | -6 | 0 | -3 |
| 2 | 5 | -4 | 882 | 425 | 5 | 0 | -7 | -297 | -199 | 9 | -4 | 1 | -1302 | -319 | 15 | 24 | -4 | -0 | 3 |
| 2 | 5 | -3 | 104 | 617 | 5 | 0 | -6 | -2556 | -1761 | 9 | -4 | 2 | -343 | 5 | 15 | 25 | -6 | 0 | -2 |
| 2 | 5 | -2 | 822 | -1086 | 5 | 0 | -5 | -20524 | -13830 | 9 | -4 | 3 | -49 | 5 | 15 | 25 | -4 | -0 | 2 |
| 2 | 5 | -1 | -71 | -530 | 5 | 0 | -4 | -153838 | -103686 | 9 | -4 | 4 | -7 | -0 | 16 | -21 | 1 | 1 | -3 |
| 2 | 5 | 0 | -1212 | 1265 | 5 | 0 | -3 | -993908 | -665343 | 9 | -3 | -6 | 5 | -0 | 16 | -21 | 2 | 3 | 0 |
| 2 | 5 | 1 | -111 | 139 | 5 | 0 | -2 | -2270690 | -1342681 | 9 | -3 | -5 | -3 | -1 | 16 | -21 | 3 | -1 | 3 |
| 2 | 5 | 2 | -15 | 16 | 5 | 0 | -1 | 3592048 | 2516137 | 9 | -3 | -4 | -50 | -10 | 16 | -21 | 4 | -1 | -0 |
| 2 | 6 | -12 | -1 | 2 | 5 | 0 | 0 | 5170628 | 3078375 | 9 | -3 | -3 | -80 | -64 | 16 | -20 | 0 | 9 | -7 |
| 2 | 6 | -11 | -2 | 3 | 5 | 0 | 1 | 369098 | 225380 | 9 | -3 | -2 | -617 | -99 | 16 | -20 | 1 | 80 | -62 |
| 2 | 6 | -10 | -13 | 66 | 5 | 0 | 2 | 32903 | 20579 | 9 | -3 | -1 | 269 | 103 | 16 | -20 | 2 | 101 | 60 |
| 2 | 6 | -9 | 13 | -41 | 5 | 0 | 3 | 3389 | 2137 | 9 | -3 | 0 | 1695 | 286 | 16 | -20 | 3 | -94 | 82 |
| 2 | 6 | -8 | 10 | -17 | 5 | 0 | 4 | 369 | 235 | 9 | -3 | 1 | 151 | 5 | 16 | -20 | 4 | -45 | -15 |
| 2 | 6 | -7 | -13 | -54 | 5 | 0 | 5 | 42 | 27 | 9 | -3 | 2 | 15 | -1 | 16 | -20 | 5 | -5 | -3 |
| 2 | 6 | -6 | 59 | -186 | 5 | 0 | 6 | 5 | 3 | 9 | -3 | 3 | 2 | -1 | 16 | -19 | -4 | 3 | -0 |
| 2 | 6 | -5 | 279 | -65 | 5 | 1 | -11 | -2 | -3 | 9 | -3 | 4 | -1 | -2 | 16 | -19 | -3 | 27 | -3 |
| 2 | 6 | -4 | 89 | 170 | 5 | 1 | -10 | -6 | 2 | 9 | -2 | -10 | 1 | 0 | 16 | -19 | -2 | 238 | -30 |
| 2 | 6 | -3 | -23 | 41 | 5 | 1 | -9 | -10 | 13 | 9 | -2 | -9 | 5 | 1 | 16 | -19 | -1 | 2103 | -266 |
| 2 | 6 | -2 | 66 | -93 | 5 | 1 | -8 | -69 | 1 | 9 | -2 | -8 | 17 | 6 | 16 | -19 | 0 | 20711 | -2550 |
| 2 | 6 | -1 | -35 | -3 | 5 | 1 | -7 | -304 | -17 | 9 | -2 | -7 | -21 | -26 | 16 | -19 | 1 | 224232 | -27663 |
| 2 | 6 | 0 | -74 | 88 | 5 | 1 | -6 | -2621 | -620 | 9 | -2 | -6 | 17 | 27 | 16 | -19 | 2 | -278 | -227 |

# Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 6 | 1 | -7 | 30 | 5 | 1 | -5 | -16766 | -5085 | 9 | -2 | -5 | -17 | 32 | 16 | -19 | 3 | -221585 | 27325 |
| 2 | 6 | 3 | -0 | 2 | 5 | 1 | -4 | -86384 | -40229 | 9 | -2 | -4 | -1365 | -440 | 16 | -19 | 4 | -20618 | 2624 |
| 2 | 7 | -12 | -3 | 3 | 5 | 1 | -3 | -104528 | -288821 | 9 | -2 | -3 | -4217 | -9430 | 16 | -19 | 5 | -2158 | 278 |
| 2 | 7 | -10 | 44 | 92 | 5 | 1 | -2 | 209487 | -525281 | 9 | -2 | -2 | 3431 | -29842 | 16 | -19 | 6 | -238 | 30 |
| 2 | 7 | -9 | -32 | -13 | 5 | 1 | -1 | 311870 | 1053118 | 9 | -2 | -1 | 2137 | 31882 | 16 | -19 | 7 | -27 | 3 |
| 2 | 7 | -8 | -43 | -44 | 5 | 1 | 0 | 795171 | 958620 | 9 | -2 | 0 | 14267 | 49263 | 16 | -19 | 8 | -3 | 0 |
| 2 | 7 | -7 | -33 | -88 | 5 | 1 | 1 | 59593 | 71959 | 9 | -2 | 1 | 1214 | 3705 | 16 | -18 | 0 | 5 | 9 |
| 2 | 7 | -6 | 57 | -68 | 5 | 1 | 2 | 5575 | 6730 | 9 | -2 | 2 | 118 | 331 | 16 | -18 | 1 | 87 | 98 |
| 2 | 7 | -5 | 58 | 21 | 5 | 1 | 3 | 578 | 713 | 9 | -2 | 3 | 15 | 39 | 16 | -18 | 2 | 2 | -2 |
| 2 | 7 | -4 | 7 | 28 | 5 | 1 | 4 | 66 | 80 | 9 | -2 | 4 | 2 | 3 | 16 | -18 | 3 | -71 | -80 |
| 2 | 7 | -3 | -5 | 8 | 5 | 1 | 5 | 5 | 11 | 9 | -1 | -7 | 8 | 2 | 16 | -18 | 4 | -7 | -7 |
| 2 | 7 | -2 | 1 | 2 | 5 | 1 | 6 | -3 | 3 | 9 | -1 | -6 | 19 | -0 | 16 | -17 | -1 | -1 | 2 |
| 2 | 7 | 0 | -5 | -4 | 5 | 2 | -12 | -1 | 1 | 9 | -1 | -5 | -16 | 22 | 16 | -17 | 0 | 3 | 2 |
| 2 | 8 | -12 | -9 | -3 | 5 | 2 | -11 | -0 | 4 | 9 | -1 | -4 | -16 | 11 | 16 | -17 | 1 | 40 | 32 |
| 2 | 8 | -11 | 8 | 4 | 5 | 2 | -10 | -14 | 10 | 9 | -1 | -3 | 13 | 30 | 16 | -17 | 3 | -28 | -24 |
| 2 | 8 | -10 | 58 | 52 | 5 | 2 | -9 | 15 | -1 | 9 | -1 | -2 | -34 | 28 | 16 | -17 | 4 | -3 | -2 |
| 2 | 8 | -9 | -47 | -5 | 5 | 2 | -8 | -42 | 50 | 9 | -1 | -1 | 20 | -53 | 16 | -16 | 0 | -1 | 2 |
| 2 | 8 | -8 | -56 | -24 | 5 | 2 | -7 | -346 | 177 | 9 | -1 | 0 | -4 | -84 | 16 | -16 | 1 | -19 | 31 |
| 2 | 8 | -7 | -25 | -48 | 5 | 2 | -6 | -2139 | 1023 | 9 | -1 | 1 | 1 | -5 | 16 | -16 | 3 | 12 | -19 |
| 2 | 8 | -6 | 5 | -25 | 5 | 2 | -5 | -9533 | 2769 | 9 | -1 | 2 | 9 | 7 | 16 | -16 | 4 | 1 | -2 |
| 2 | 8 | -5 | 4 | 21 | 5 | 2 | -4 | -9403 | -22114 | 9 | -1 | 3 | 1 | 1 | 16 | -15 | 0 | 0 | 3 |
| 2 | 8 | -4 | -8 | 22 | 5 | 2 | -3 | 109657 | -137133 | 9 | 0 | -6 | -2 | -3 | 16 | -15 | 1 | -16 | -16 |
| 2 | 8 | -3 | 3 | -2 | 5 | 2 | -2 | 81362 | -28125 | 9 | 0 | -5 | 9 | 7 | 16 | -15 | 2 | -0 | -6 |
| 2 | 8 | -2 | 3 | -3 | 5 | 2 | -1 | -80758 | 172313 | 9 | 0 | -4 | 1 | 7 | 16 | -15 | 3 | 8 | 9 |
| 2 | 8 | -1 | -3 | -1 | 5 | 2 | 0 | 83617 | 185966 | 9 | 0 | -3 | -13 | -16 | 16 | -14 | -1 | -2 | -0 |
| 2 | 9 | -13 | -1 | 0 | 5 | 2 | 1 | 6606 | 14549 | 9 | 0 | -2 | 1 | -19 | 16 | -14 | 0 | -14 | 1 |
| 2 | 9 | -12 | -14 | 1 | 5 | 2 | 2 | 634 | 1417 | 9 | 0 | -1 | -0 | 7 | 16 | -14 | 1 | 8 | -4 |
| 2 | 9 | -11 | 8 | -7 | 5 | 2 | 3 | 88 | 156 | 9 | 0 | 0 | 7 | -2 | 16 | -14 | 2 | 20 | -1 |
| 2 | 9 | -10 | 29 | 10 | 5 | 2 | 4 | 10 | 20 | 9 | 0 | 1 | -2 | 4 | 16 | -14 | 3 | -0 | 1 |
| 2 | 9 | -9 | -8 | 17 | 5 | 2 | 5 | -2 | 0 | 9 | 1 | -7 | -2 | -0 | 16 | -13 | -2 | 1 | -1 |
| 2 | 9 | -8 | -19 | -4 | 5 | 3 | -11 | 4 | 1 | 9 | 1 | -6 | 4 | -3 | 16 | -13 | -1 | 0 | -21 |
| 2 | 9 | -7 | -17 | -6 | 5 | 3 | -10 | -17 | 10 | 9 | 1 | -5 | 1 | -5 | 16 | -13 | 0 | 92 | -311 |
| 2 | 9 | -6 | -23 | -8 | 5 | 3 | -9 | 26 | 11 | 9 | 1 | -4 | -3 | 4 | 16 | -13 | 1 | 41 | 40 |
| 2 | 9 | -5 | 5 | -7 | 5 | 3 | -8 | -20 | 55 | 9 | 1 | -3 | -1 | 2 | 16 | -13 | 2 | -97 | 330 |
| 2 | 9 | -4 | 8 | 3 | 5 | 3 | -7 | -161 | 386 | 9 | 1 | -2 | -4 | 0 | 16 | -13 | 3 | -14 | 8 |
| 2 | 9 | -3 | 1 | 0 | 5 | 3 | -6 | -898 | 1258 | 9 | 1 | -1 | 4 | -15 | 16 | -13 | 4 | -1 | 1 |
| 2 | 10 | -12 | -16 | 2 | 5 | 3 | -5 | -2256 | -2555 | 9 | 1 | 0 | 1 | -0 | 16 | -12 | -1 | 2 | 1 |
| 2 | 10 | -11 | -5 | -5 | 5 | 3 | -4 | 6379 | -32390 | 9 | 1 | 1 | -1 | 2 | 16 | -12 | 0 | 20 | 13 |
| 2 | 10 | -10 | 3 | -17 | 5 | 3 | -3 | 44419 | -10922 | 9 | 2 | -6 | -2 | -1 | 16 | -12 | 2 | -17 | -11 |
| 2 | 10 | -9 | -8 | 1 | 5 | 3 | -2 | -420 | -7331 | 9 | 2 | -5 | -1 | 1 | 16 | -12 | 3 | -2 | -1 |
| 2 | 10 | -8 | 2 | 9 | 5 | 3 | -1 | -31058 | 12176 | 9 | 2 | -4 | 2 | 1 | 16 | 6 | -3 | -1 | -0 |
| 2 | 10 | -7 | -17 | -0 | 5 | 3 | 0 | 10432 | 40573 | 9 | 2 | -3 | -3 | 3 | 16 | 6 | -1 | 1 | 0 |
| 2 | 10 | -6 | -2 | -6 | 5 | 3 | 1 | 899 | 3388 | 10 | -23 | 2 | -1 | 0 | 16 | 18 | -5 | -4 | -2 |
| 2 | 11 | -12 | -4 | 1 | 5 | 3 | 2 | 89 | 342 | 10 | -23 | 4 | 1 | -0 | 16 | 18 | -3 | 4 | 2 |
| 2 | 11 | -11 | -1 | -3 | 5 | 3 | 3 | 4 | 37 | 10 | -18 | 1 | 4 | -0 | 16 | 19 | -7 | -4 | 1 |
| 2 | 11 | -10 | 5 | -3 | 5 | 3 | 4 | 1 | 3 | 10 | -18 | 3 | -4 | 0 | 16 | 19 | -6 | -37 | 9 |
| 2 | 11 | -9 | 2 | 3 | 5 | 4 | -12 | 1 | 3 | 10 | -17 | 0 | -0 | 2 | 16 | 19 | -5 | -402 | 99 |
| 2 | 11 | -8 | -1 | 1 | 5 | 4 | -11 | 6 | 18 | 10 | -17 | 1 | -1 | 16 | 16 | 19 | -3 | 384 | -94 |
| 2 | 11 | -7 | -1 | -1 | 5 | 4 | -10 | 17 | -18 | 10 | -17 | 3 | 1 | -16 | 16 | 19 | -2 | 37 | -9 |
| 3 | -14 | 7 | 1 | -2 | 5 | 4 | -9 | -17 | 5 | 10 | -17 | 4 | 0 | -2 | 16 | 19 | -1 | 4 | -1 |
| 3 | -14 | 8 | 3 | -2 | 5 | 4 | -8 | 21 | 66 | 10 | -16 | 1 | -9 | -4 | 16 | 20 | -6 | -3 | 2 |
| 3 | -14 | 9 | 1 | 3 | 5 | 4 | -7 | -21 | 236 | 10 | -16 | 3 | 9 | 4 | 16 | 20 | -5 | -34 | 15 |
| 3 | -14 | 10 | -1 | 5 | 5 | 4 | -6 | -737 | -463 | 10 | -15 | 1 | 9 | -1 | 16 | 20 | -3 | 75 | -11 |
| 3 | -14 | 11 | -2 | -1 | 5 | 4 | -5 | -3222 | -6936 | 10 | -15 | 2 | 8 | -0 | 16 | 20 | -2 | 3 | -2 |
| 3 | -14 | 12 | -2 | -4 | 5 | 4 | -4 | 7444 | -7524 | 10 | -15 | 3 | -6 | 1 | 16 | 21 | -6 | -1 | -0 |
| 3 | -13 | 0 | 3 | -2 | 5 | 4 | -3 | 8316 | 255 | 10 | -15 | 4 | -2 | 1 | 16 | 21 | -5 | -14 | -2 |
| 3 | -13 | 4 | -3 | 2 | 5 | 4 | -2 | -11221 | -43657 | 10 | -14 | 0 | 1 | 0 | 16 | 21 | -3 | 8 | 1 |
| 3 | -13 | 5 | -8 | -3 | 5 | 4 | -1 | -12066 | -5155 | 10 | -14 | 1 | 34 | 16 | 16 | 21 | -2 | 1 | 0 |
| 3 | -13 | 6 | -13 | -11 | 5 | 4 | 0 | 10332 | 49265 | 10 | -14 | 2 | 2 | -2 | 16 | 24 | -6 | -1 | -2 |
| 3 | -13 | 7 | -8 | -20 | 5 | 4 | 1 | 944 | 4468 | 10 | -14 | 3 | -29 | 3 | 16 | 24 | -4 | 1 | 2 |
| 3 | -13 | 8 | 7 | 2 | 5 | 4 | 2 | 91 | 463 | 10 | -14 | 4 | -5 | -3 | 16 | 25 | -7 | -1 | -2 |
| 3 | -13 | 9 | 1 | 11 | 5 | 4 | 3 | 10 | 51 | 10 | -14 | 5 | 5 | -6 | 16 | 25 | -6 | -9 | -22 |
| 3 | -13 | 10 | -12 | 10 | 5 | 4 | 4 | 1 | 6 | 10 | -14 | 6 | 2 | 3 | 16 | 25 | -4 | 9 | 22 |

# Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | -13 | 11 | -4 | -6 | 5 | 5 | -13 | 2 | 1 | 10 | -13 | -1 | 2 | 2 | 16 | 25 | -3 | 1 | 2 |
| 3 | -13 | 12 | -1 | -10 | 5 | 5 | -12 | 3 | 2 | 10 | -13 | 0 | 8 | 2 | 17 | -13 | -1 | -3 | 1 |
| 3 | -13 | 13 | 0 | -2 | 5 | 5 | -11 | 41 | 40 | 10 | -13 | 1 | 242 | 132 | 17 | -13 | 0 | -32 | 10 |
| 3 | -12 | 3 | 3 | 7 | 5 | 5 | -10 | -1 | -31 | 10 | -13 | 2 | 4 | -76 | 17 | -13 | 2 | 32 | -10 |
| 3 | -12 | 4 | 3 | 14 | 5 | 5 | -9 | -10 | 17 | 10 | -13 | 3 | -100 | -66 | 17 | -13 | 3 | 3 | -1 |
| 3 | -12 | 5 | -12 | -3 | 5 | 5 | -8 | 3 | 14 | 10 | -13 | 4 | -2 | 21 | 17 | 12 | -4 | -0 | 3 |
| 3 | -12 | 6 | -16 | -46 | 5 | 5 | -7 | -261 | -45 | 10 | -13 | 5 | -8 | 3 | 17 | 12 | -2 | 0 | -3 |
| 3 | -12 | 7 | -9 | -32 | 5 | 5 | -6 | -1692 | -964 | 10 | -13 | 6 | -8 | 1 | 18 | 11 | -4 | -1 | 2 |
| 3 | -12 | 8 | -24 | -19 | 5 | 5 | -5 | 317 | -2740 | 10 | -12 | -2 | -1 | -2 | 18 | 11 | -2 | 1 | -2 |
| 3 | -12 | 9 | -0 | -15 | 5 | 5 | -4 | 1850 | -374 | 10 | -12 | -1 | -7 | -8 | 18 | 12 | -4 | 2 | 0 |
| 3 | -12 | 10 | 30 | 16 | 5 | 5 | -3 | 242 | 544 | 10 | -12 | 0 | -10 | -39 | 18 | 12 | -2 | -2 | -0 |
| 3 | -12 | 11 | 8 | 3 | 5 | 5 | -2 | -432 | -461 | 10 | -12 | 1 | 808 | 793 | 18 | 13 | -4 | 2 | -1 |
| 3 | -12 | 12 | -5 | -7 | 5 | 5 | -1 | 167 | 426 | 10 | -12 | 2 | 213 | 116 | 18 | 13 | -2 | -2 | 1 |
| 3 | -11 | 1 | -2 | -1 | 5 | 5 | 0 | 131 | 561 | 10 | -12 | 3 | -304 | -319 | 19 | -14 | -1 | -0 | 1 |
| 3 | -11 | 2 | -1 | -3 | 5 | 5 | 1 | 11 | 52 | 10 | -12 | 4 | -88 | -28 | 19 | -14 | 0 | -3 | 11 |
| 3 | -11 | 3 | 3 | -1 | 5 | 5 | 2 | 1 | 6 | 10 | -12 | 5 | -11 | -3 | 19 | -14 | 2 | 3 | -11 |
| 3 | -11 | 4 | 8 | 1 | 5 | 6 | -13 | 3 | 1 | 10 | -12 | 6 | -7 | -11 | 19 | -14 | 3 | 0 | -1 |
| 3 | -11 | 5 | 10 | 18 | 5 | 6 | -12 | 16 | 3 | 10 | -12 | 7 | 9 | -5 | 19 | 5 | -3 | -5 | 4 |
| 3 | -11 | 6 | -17 | 27 | 5 | 6 | -11 | -4 | 3 | 10 | -12 | 8 | 5 | 5 | 19 | 5 | -1 | 5 | -4 |
| 3 | -11 | 7 | -58 | -21 | 5 | 6 | -10 | -16 | -61 | 10 | -12 | 9 | -2 | 1 | 19 | 11 | -5 | 7 | -10 |
| 3 | -11 | 8 | -13 | -40 | 5 | 6 | -9 | 29 | 5 | 10 | -11 | -3 | 3 | -2 | 19 | 11 | -4 | 77 | -100 |
| 3 | -11 | 9 | 25 | 7 | 5 | 6 | -8 | -79 | 75 | 10 | -11 | -2 | 20 | -13 | 19 | 11 | -2 | -81 | 105 |
| 3 | -11 | 10 | 14 | 16 | 5 | 6 | -7 | -519 | 62 | 10 | -11 | -1 | 226 | -156 | 19 | 11 | -1 | -7 | 10 |
| 3 | -11 | 11 | 22 | 8 | 5 | 6 | -6 | -405 | -683 | 10 | -11 | 0 | 2125 | -1455 | 19 | 12 | -5 | 2 | 3 |
| 3 | -11 | 12 | 6 | 1 | 5 | 6 | -5 | 407 | -427 | 10 | -11 | 1 | -3246 | 3348 | 19 | 12 | -4 | 21 | 35 |
| 3 | -11 | 13 | 1 | 0 | 5 | 6 | -4 | 267 | 122 | 10 | -11 | 2 | -2656 | 1972 | 19 | 12 | -2 | -18 | -30 |
| 3 | -10 | 0 | 1 | -0 | 5 | 6 | -3 | -24 | 73 | 10 | -11 | 3 | 911 | -1007 | 19 | 12 | -1 | -2 | -3 |
| 3 | -10 | 1 | 4 | -1 | 5 | 6 | -2 | -39 | -16 | 10 | -11 | 4 | 128 | -195 | 19 | 13 | -4 | -12 | 3 |
| 3 | -10 | 2 | -2 | -11 | 5 | 6 | -1 | -7 | 14 | 10 | -11 | 5 | 24 | -28 | 19 | 13 | -2 | 8 | -2 |
| 3 | -10 | 3 | 22 | -10 | 5 | 6 | 0 | 2 | 6 | 10 | -11 | 6 | 6 | -5 | 19 | 14 | -4 | -0 | -6 |
| 3 | -10 | 4 | 43 | 34 | 5 | 7 | -14 | 2 | -1 | 10 | -11 | 7 | -2 | 13 | 19 | 14 | -2 | 0 | 3 |
| 3 | -10 | 5 | -6 | 77 | 5 | 7 | -13 | 2 | -1 | 10 | -11 | 8 | -4 | 9 | 20 | 10 | -4 | 0 | 9 |
| 3 | -10 | 6 | -69 | 63 | 5 | 7 | -12 | 48 | -23 | 10 | -10 | -4 | 0 | 2 | 20 | 10 | -2 | -0 | -9 |
| 3 | -10 | 7 | -79 | 8 | 5 | 7 | -11 | -17 | 18 | 10 | -10 | -3 | 4 | 23 | 20 | 11 | -6 | -9 | -2 |
| 3 | -10 | 8 | -46 | 4 | 5 | 7 | -10 | -17 | -15 | 10 | -10 | -2 | 40 | 212 | 20 | 11 | -5 | -84 | -23 |
| 3 | -10 | 9 | 11 | 17 | 5 | 7 | -9 | -14 | 24 | 10 | -10 | -1 | 449 | 2057 | 20 | 11 | -4 | -917 | -247 |
| 3 | -10 | 10 | 5 | -0 | 5 | 7 | -8 | -102 | 100 | 10 | -10 | 0 | 6571 | 21488 | 20 | 11 | -3 | 3 | 1 |
| 3 | -10 | 11 | 2 | -1 | 5 | 7 | -7 | -201 | -77 | 10 | -10 | 1 | 4715 | 6408 | 20 | 11 | -2 | 891 | 240 |
| 3 | -10 | 12 | 11 | -3 | 5 | 7 | -6 | 21 | -159 | 10 | -10 | 2 | -5999 | -19780 | 20 | 11 | -1 | 84 | 23 |
| 3 | -10 | 13 | 2 | -0 | 5 | 7 | -5 | 78 | -17 | 10 | -10 | 3 | -2011 | -4104 | 20 | 11 | 0 | 9 | 2 |
| 3 | -9 | -1 | 5 | -4 | 5 | 7 | -4 | 11 | 19 | 10 | -10 | 4 | -202 | -512 | 20 | 12 | -5 | 1 | -2 |
| 3 | -9 | 0 | 43 | -11 | 5 | 7 | -3 | -6 | 3 | 10 | -10 | 5 | -12 | -18 | 20 | 12 | -4 | 15 | -25 |
| 3 | -9 | 1 | 72 | 48 | 5 | 7 | -2 | -3 | -3 | 10 | -10 | 6 | -37 | 12 | 20 | 12 | -2 | -12 | 20 |
| 3 | -9 | 2 | 4 | -82 | 5 | 7 | 0 | -0 | -1 | 10 | -10 | 7 | -1 | -27 | 20 | 12 | -1 | -1 | 2 |
| 3 | -9 | 3 | 148 | 5 | 5 | 8 | -15 | 1 | -2 | 10 | -10 | 8 | 1 | 3 | 20 | 13 | -4 | 9 | 10 |
| 3 | -9 | 4 | 129 | 280 | 5 | 8 | -14 | 3 | -7 | 10 | -9 | -3 | -5 | -3 | 20 | 13 | -2 | -6 | -6 |
| 3 | -9 | 5 | -85 | 331 | 5 | 8 | -13 | 1 | 1 | 10 | -9 | -2 | -34 | -2 | 20 | 14 | -4 | -6 | 4 |
| 3 | -9 | 6 | -179 | 136 | 5 | 8 | -12 | 4 | 7 | 10 | -9 | -1 | -276 | -128 | 20 | 14 | -2 | 3 | -2 |
| 3 | -9 | 7 | -6 | -4 | 5 | 8 | -11 | -10 | 41 | 10 | -9 | 0 | -2200 | -98 | 21 | 10 | -5 | -0 | 1 |
| 3 | -9 | 8 | -24 | 18 | 5 | 8 | -10 | -15 | 16 | 10 | -9 | 1 | -1163 | 877 | 21 | 10 | -4 | -1 | 14 |
| 3 | -9 | 9 | 20 | 3 | 5 | 8 | -9 | -19 | 27 | 10 | -9 | 2 | 1539 | -20 | 21 | 10 | -2 | 1 | -14 |
| 3 | -9 | 10 | 26 | -34 | 5 | 8 | -8 | -57 | 8 | 10 | -9 | 3 | 628 | -251 | 21 | 10 | -1 | 0 | -1 |
| 3 | -9 | 11 | 2 | -4 | 5 | 8 | -7 | -29 | -43 | 10 | -9 | 4 | 143 | 40 | 21 | 11 | -5 | -2 | -1 |
| 3 | -9 | 12 | 1 | -2 | 5 | 8 | -6 | 16 | -22 | 10 | -9 | 5 | -17 | 14 | 21 | 11 | -4 | -25 | -11 |
| 3 | -8 | -3 | 6 | -3 | 5 | 8 | -5 | 9 | 3 | 10 | -9 | 6 | -37 | -33 | 21 | 11 | -2 | 22 | 10 |
| 3 | -8 | -2 | 56 | -22 | 5 | 8 | -4 | 2 | 2 | 10 | -9 | 7 | -7 | -6 | 21 | 11 | -1 | 2 | 1 |
| 3 | -8 | -1 | 530 | -190 | 5 | 8 | -3 | -3 | -1 | 10 | -8 | -3 | 3 | 2 | 21 | 12 | -4 | 4 | -5 |
| 3 | -8 | 0 | 5460 | -1909 | 5 | 9 | -14 | 1 | -2 | 10 | -8 | -2 | -0 | -11 | 21 | 12 | -2 | -4 | 5 |
| 3 | -8 | 1 | 942 | 2674 | 5 | 9 | -13 | -5 | -25 | 10 | -8 | -1 | 67 | -162 | 22 | 10 | -6 | -1 | 2 |
| 3 | -8 | 2 | -5214 | 1832 | 5 | 9 | -12 | 11 | -12 | 10 | -8 | 0 | -858 | -944 | 22 | 10 | -5 | -6 | 18 |
| 3 | -8 | 3 | 199 | -115 | 5 | 9 | -11 | 16 | -2 | 10 | -8 | 1 | -1538 | -4 | 22 | 10 | -4 | -60 | 194 |
| 3 | -8 | 4 | 96 | 1215 | 5 | 9 | -10 | 2 | 31 | 10 | -8 | 2 | 292 | 42 | 22 | 10 | -2 | 61 | -196 |
| 3 | -8 | 5 | -325 | 838 | 5 | 9 | -9 | -13 | 35 | 10 | -8 | 3 | 492 | 148 | 22 | 10 | -1 | 6 | -18 |

## Table 1 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | -8 | 6 | -42 | 14 | 5 | 9 | -8 | -26 | -8 | 10 | -8 | 4 | 74 | 62 | 22 | 10 | 0 | 1 | -2 |
| 3 | -8 | 7 | 13 | -38 | 5 | 9 | -7 | -2 | -19 | 10 | -8 | 5 | 64 | 36 | 22 | 16 | -5 | -6 | -3 |
| 3 | -8 | 8 | 25 | 32 | 5 | 9 | -6 | 28 | 13 | 10 | -8 | 6 | -32 | 1 | 22 | 16 | -3 | 6 | 3 |
| 3 | -8 | 9 | 6 | -6 | 5 | 9 | -5 | 10 | 28 | 10 | -8 | 7 | -2 | -1 | 23 | 16 | -7 | -2 | -2 |
| 3 | -8 | 10 | 2 | -10 | 5 | 9 | -4 | -5 | -3 | 10 | -7 | -4 | 2 | -1 | 23 | 16 | -6 | -20 | -14 |
| 3 | -8 | 11 | -0 | -3 | 5 | 9 | -3 | -3 | -5 | 10 | -7 | -3 | 8 | -4 | 23 | 16 | -5 | -211 | -154 |
| 3 | -7 | -4 | 7 | -2 | 5 | 10 | -14 | 7 | 5 | 10 | -7 | -2 | -28 | -1 | 23 | 16 | -3 | 211 | 154 |
| 3 | -7 | -3 | 69 | -23 | 5 | 10 | -13 | 2 | 14 | 10 | -7 | -1 | -247 | -51 | 23 | 16 | -2 | 20 | 14 |
| 3 | -7 | -2 | 622 | -198 | 5 | 10 | -12 | -10 | -3 | 10 | -7 | 0 | -3472 | -2792 | 23 | 16 | -1 | 2 | 2 |
| 3 | -7 | -1 | 6042 | -1925 | 5 | 10 | -11 | 12 | 42 | 10 | -7 | 1 | -4601 | -2705 | 25 | 15 | -5 | -2 | 2 |
| 3 | -7 | 0 | 67963 | -21890 | 5 | 10 | -10 | -9 | 56 | 10 | -7 | 2 | 2481 | 1142 | 25 | 15 | -3 | 2 | -2 |

Table 2. Fourier representation of $\delta y_{2mjk}$ (periodic part). The coefficients are in units of $10^{-13}$

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | -30 | 0 | 3 | -7 | -2 | -198 | -622 | 5 | 10 | -13 | 14 | -2 | 10 | -7 | 0 | -2735 | 3518 |
| 0 | 0 | 1 | -84 | -4289 | 3 | -7 | -1 | -1929 | -6036 | 5 | 10 | -12 | 12 | -6 | 10 | -7 | 1 | -2262 | 4534 |
| 0 | 0 | 2 | -7 | -622 | 3 | -7 | 0 | -21850 | -67828 | 5 | 10 | -11 | -39 | 45 | 10 | -7 | 2 | -1599 | 949 |
| 0 | 0 | 3 | 7 | -74 | 3 | -7 | 1 | -25526 | -9849 | 5 | 10 | -10 | -75 | 2 | 10 | -7 | 3 | -676 | 1152 |
| 0 | 0 | 4 | 0 | -12 | 3 | -7 | 2 | -17950 | -66249 | 5 | 10 | -9 | -22 | -68 | 10 | -7 | 4 | -139 | 121 |
| 0 | 0 | 5 | -1 | 3 | 3 | -7 | 3 | -5841 | -12665 | 5 | 10 | -8 | 49 | -32 | 10 | -7 | 5 | -20 | -4 |
| 0 | 0 | 6 | 0 | 2 | 3 | -7 | 4 | 1980 | -3433 | 5 | 10 | -7 | -3 | -9 | 10 | -7 | 6 | -8 | -9 |
| 0 | 1 | -9 | -6 | -6 | 3 | -7 | 5 | 324 | -764 | 5 | 10 | -6 | 11 | -4 | 10 | -7 | 7 | -2 | -2 |
| 0 | 1 | -8 | -8 | -7 | 3 | -7 | 6 | 208 | -182 | 5 | 10 | -5 | 1 | -1 | 10 | -6 | -4 | 4 | 2 |
| 0 | 1 | -6 | 79 | 73 | 3 | -7 | 7 | 34 | -34 | 5 | 11 | -15 | 0 | -3 | 10 | -6 | -3 | 7 | -3 |
| 0 | 1 | -5 | 490 | 381 | 3 | -7 | 8 | -0 | 8 | 5 | 11 | -14 | 6 | -8 | 10 | -6 | -2 | -38 | -21 |
| 0 | 1 | -4 | 3564 | 2637 | 3 | -7 | 9 | 21 | -19 | 5 | 11 | -13 | 11 | -13 | 10 | -6 | -1 | -358 | -430 |
| 0 | 1 | -3 | 22945 | 16511 | 3 | -7 | 10 | 4 | -4 | 5 | 11 | -12 | 11 | 1 | 10 | -6 | 0 | -7528 | -7082 |
| 0 | 1 | -2 | 84142 | 57250 | 3 | -6 | -4 | -2 | -9 | 5 | 11 | -11 | -8 | 18 | 10 | -6 | 1 | -4624 | -2920 |
| 0 | 1 | -1 | 75464 | 62837 | 3 | -6 | -3 | -19 | -85 | 5 | 11 | -10 | 5 | 7 | 10 | -6 | 2 | -3212 | -3126 |
| 0 | 1 | 0 | 219353 | 148315 | 3 | -6 | -2 | -175 | -789 | 5 | 11 | -9 | -6 | 8 | 10 | -6 | 3 | -1357 | -1004 |
| 0 | 1 | 1 | 22498 | 20232 | 3 | -6 | -1 | -1739 | -7937 | 5 | 11 | -8 | -3 | -1 | 10 | -6 | 4 | -207 | -151 |
| 0 | 1 | 2 | 1839 | 1897 | 3 | -6 | 0 | -21100 | -96914 | 5 | 11 | 7 | -20 | 6 | 10 | -6 | 5 | -41 | -19 |
| 0 | 1 | 3 | 169 | 193 | 3 | -6 | 1 | -46531 | -66724 | 5 | 11 | 8 | -16 | -21 | 10 | -6 | 6 | -6 | -2 |
| 0 | 1 | 4 | 41 | 47 | 3 | -6 | 2 | -5941 | -94641 | 5 | 11 | 9 | 27 | -23 | 10 | -5 | -5 | 4 | 2 |
| 0 | 1 | 5 | -7 | 5 | 3 | -6 | 3 | -6345 | -39328 | 5 | 11 | 10 | 12 | 16 | 10 | -5 | -4 | -0 | 12 |
| 0 | 1 | 6 | -1 | 1 | 3 | -6 | 4 | -1169 | -7492 | 5 | 11 | 11 | -10 | 15 | 10 | -5 | -3 | 69 | 50 |
| 0 | 2 | -10 | 2 | 2 | 3 | -6 | 5 | 511 | -2251 | 5 | 12 | -14 | 2 | -4 | 10 | -5 | -2 | 406 | 244 |
| 0 | 2 | -9 | -0 | 3 | 3 | -6 | 6 | 109 | -397 | 5 | 12 | -13 | 4 | 1 | 10 | -5 | -1 | 3986 | 2208 |
| 0 | 2 | -8 | -23 | 19 | 3 | -6 | 7 | 46 | -82 | 5 | 12 | -12 | 2 | 0 | 10 | -5 | 0 | 5107 | -159 |
| 0 | 2 | -7 | -33 | -57 | 3 | -6 | 8 | 2 | -11 | 5 | 12 | -11 | 3 | 1 | 10 | -5 | 1 | 4251 | 2595 |
| 0 | 2 | -6 | -30 | 4 | 3 | -6 | 11 | 0 | -1 | 5 | 12 | -10 | -1 | 3 | 10 | -5 | 2 | 2349 | 132 |
| 0 | 2 | -5 | -104 | -93 | 3 | -5 | -5 | -0 | -2 | 5 | 12 | -9 | -1 | 1 | 10 | -5 | 3 | 262 | -9 |
| 0 | 2 | -4 | -526 | 757 | 3 | -5 | -4 | -9 | -24 | 5 | 12 | -8 | -1 | -1 | 10 | -5 | 4 | 37 | 0 |
| 0 | 2 | -3 | -8868 | -924 | 3 | -5 | -3 | -48 | -241 | 6 | -15 | -1 | -1 | 1 | 10 | -5 | 5 | 7 | -0 |
| 0 | 2 | -2 | -11068 | 7964 | 3 | -5 | -2 | -433 | -2182 | 6 | -15 | 0 | -6 | 11 | 10 | -4 | -6 | 3 | -1 |
| 0 | 2 | -1 | -32558 | 6047 | 3 | -5 | -1 | -4291 | -22709 | 6 | -15 | 1 | -60 | 118 | 10 | -4 | -5 | 22 | -9 |
| 0 | 2 | 0 | -43285 | 11736 | 3 | -5 | 0 | -51995 | -295192 | 6 | -15 | 3 | -60 | 118 | 10 | -4 | -4 | 196 | -36 |
| 0 | 2 | 1 | -5897 | 1202 | 3 | -5 | 1 | -73617 | -286539 | 6 | -15 | 4 | -6 | 11 | 10 | -4 | -3 | 1531 | -281 |
| 0 | 2 | 2 | -582 | 106 | 3 | -5 | 2 | -43734 | -252032 | 6 | -15 | 5 | -1 | 1 | 10 | -4 | -2 | 10637 | -1852 |
| 0 | 2 | 3 | -61 | 13 | 3 | -5 | 3 | -21357 | -86331 | 6 | -14 | 2 | 1 | -0 | 10 | -4 | -1 | -13093 | 6746 |
| 0 | 2 | 4 | -26 | 0 | 3 | -5 | 4 | -5023 | -23083 | 6 | -14 | 4 | 1 | -0 | 10 | -4 | 0 | 34324 | -6458 |
| 0 | 2 | 5 | 6 | -0 | 3 | -5 | 5 | -856 | -3694 | 6 | -14 | 5 | 1 | -1 | 10 | -4 | 1 | -10178 | 6057 |
| 0 | 2 | 6 | -1 | 0 | 3 | -5 | 6 | -111 | -483 | 6 | -14 | 6 | 1 | 2 | 10 | -4 | 2 | -1345 | 893 |
| 0 | 3 | -7 | 2 | -5 | 3 | -5 | 7 | -0 | -45 | 6 | -14 | 7 | 1 | -1 | 10 | -4 | 3 | -157 | 107 |
| 0 | 3 | -6 | -28 | 7 | 3 | -5 | 8 | -9 | -18 | 6 | -14 | 8 | 1 | 2 | 10 | -4 | 4 | -14 | 8 |
| 0 | 3 | -5 | 10 | -40 | 3 | -5 | 9 | -1 | -3 | 6 | -13 | 3 | -2 | -4 | 10 | -3 | -6 | -2 | 1 |
| 0 | 3 | -4 | -110 | -160 | 3 | -4 | -6 | 0 | 1 | 6 | -13 | 4 | 5 | -7 | 10 | -3 | -5 | 2 | -8 |
| 0 | 3 | -3 | 849 | -2156 | 3 | -4 | -5 | -8 | -6 | 6 | -13 | 5 | -3 | 7 | 10 | -3 | -4 | 40 | -39 |
| 0 | 3 | -2 | -3056 | -1893 | 3 | -4 | -4 | -51 | -30 | 6 | -13 | 6 | -4 | 5 | 10 | -3 | -3 | 61 | -303 |
| 0 | 3 | -1 | 3402 | -7851 | 3 | -4 | -3 | -438 | -297 | 6 | -13 | 7 | -4 | -2 | 10 | -3 | -2 | 286 | -2006 |
| 0 | 3 | 0 | 117 | -7046 | 3 | -4 | -2 | -4161 | -2785 | 6 | -13 | 8 | -4 | 7 | 10 | -3 | -1 | -402 | -104 |
| 0 | 3 | 1 | -144 | -569 | 3 | -4 | -1 | -42895 | -29691 | 6 | -13 | 9 | -3 | -2 | 10 | -3 | 0 | 732 | -5078 |
| 0 | 3 | 2 | -19 | -55 | 3 | -4 | 0 | -492322 | -413946 | 6 | -12 | 0 | 3 | -2 | 10 | -3 | 1 | -372 | -382 |
| 0 | 3 | 3 | -3 | -8 | 3 | -4 | 1 | -586474 | -497317 | 6 | -12 | 1 | -6 | 8 | 10 | -3 | 2 | -23 | -35 |
| 0 | 3 | 4 | -7 | -1 | 3 | -4 | 2 | -227871 | -185648 | 6 | -12 | 2 | 15 | -4 | 10 | -3 | 3 | -8 | -4 |
| 0 | 3 | 5 | 5 | 3 | 3 | -4 | 3 | -149499 | -128469 | 6 | -12 | 3 | -11 | 32 | 10 | -3 | 4 | 3 | -1 |
| 0 | 3 | 6 | 6 | 3 | 3 | -4 | 4 | -23244 | -19553 | 6 | -12 | 4 | -3 | -24 | 10 | -3 | 5 | 2 | -0 |
| 0 | 4 | -8 | -3 | 3 | 3 | -4 | 5 | -3049 | -2473 | 6 | -12 | 5 | 4 | -5 | 10 | -2 | -10 | -2 | -0 |
| 0 | 4 | -7 | -15 | 17 | 3 | -4 | 6 | -395 | -313 | 6 | -12 | 6 | -5 | -1 | 10 | -2 | -9 | -2 | -3 |
| 0 | 4 | -6 | -1 | -4 | 3 | -4 | 7 | -26 | -17 | 6 | -12 | 7 | 2 | -15 | 10 | -2 | -8 | -34 | -3 |
| 0 | 4 | -5 | 25 | -11 | 3 | -4 | 8 | -6 | -3 | 6 | -12 | 8 | 5 | 0 | 10 | -2 | -7 | -3 | 8 |
| 0 | 4 | -4 | 43 | -167 | 3 | -3 | -7 | 1 | -2 | 6 | -12 | 9 | 0 | -5 | 10 | -2 | -6 | -9 | -6 |
| 0 | 4 | -3 | 433 | 587 | 3 | -3 | -6 | 3 | -9 | 6 | -11 | -1 | 1 | 1 | 10 | -2 | -5 | 26 | 9 |
| 0 | 4 | -2 | 169 | -1503 | 3 | -3 | -5 | -17 | -5 | 6 | -11 | 0 | 2 | 9 | 10 | -2 | -4 | -264 | 529 |
| 0 | 4 | -1 | 2392 | 100 | 3 | -3 | -4 | -92 | -46 | 6 | -11 | 1 | -42 | 4 | 10 | -2 | -3 | -126 | -450 |
| 0 | 4 | 0 | 1318 | -788 | 3 | -3 | -3 | -947 | -402 | 6 | -11 | 2 | 36 | 68 | 10 | -2 | -2 | 962 | 6239 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 4 | 1 | 86 | -55 | 3 | -3 | -2 | -7486 | -3473 | 6 | -11 | 3 | -61 | 70 | 10 | -2 | -1 | -3057 | 4027 |
| 0 | 4 | 2 | 7 | -7 | 3 | -3 | -1 | -53063 | -25061 | 6 | -11 | 4 | -26 | -20 | 10 | -2 | 0 | -2441 | 7253 |
| 0 | 4 | 3 | -2 | -0 | 3 | -3 | 0 | 563061 | 39488 | 6 | -11 | 5 | 12 | 32 | 10 | -2 | 1 | -178 | 543 |
| 0 | 4 | 4 | 2 | 0 | 3 | -3 | 1 | -81410 | -20592 | 6 | -11 | 6 | -61 | 2 | 10 | -2 | 2 | -14 | 51 |
| 0 | 5 | -8 | 1 | 3 | 3 | -3 | 2 | 241652 | 15266 | 6 | -11 | 7 | 17 | -23 | 10 | -2 | 3 | 5 | 3 |
| 0 | 5 | -7 | 1 | 40 | 3 | -3 | 3 | 39654 | 5323 | 6 | -11 | 8 | -12 | 15 | 10 | -2 | 4 | 1 | -0 |
| 0 | 5 | -6 | 18 | 13 | 3 | -3 | 4 | 5209 | 877 | 6 | -11 | 9 | -5 | -10 | 10 | -1 | -7 | 11 | -2 |
| 0 | 5 | -5 | -18 | 5 | 3 | -3 | 5 | 652 | 161 | 6 | -10 | -3 | -0 | -1 | 10 | -1 | -6 | 16 | 16 |
| 0 | 5 | -4 | 116 | 105 | 3 | -3 | 6 | 88 | 56 | 6 | -10 | -2 | -0 | -1 | 10 | -1 | -5 | 70 | -10 |
| 0 | 5 | -3 | -103 | 110 | 3 | -3 | 7 | 14 | 1 | 6 | -10 | -1 | 11 | 28 | 10 | -1 | -4 | 109 | 103 |
| 0 | 5 | -2 | 403 | -213 | 3 | -3 | 8 | 1 | 7 | 6 | -10 | 0 | 60 | 246 | 10 | -1 | -3 | 6 | 387 |
| 0 | 5 | -1 | 326 | 468 | 3 | -3 | 9 | -2 | 4 | 6 | -10 | 1 | -699 | -376 | 10 | -1 | -2 | 1134 | 1074 |
| 0 | 5 | 0 | 377 | 61 | 3 | -2 | -8 | -5 | -2 | 6 | -10 | 2 | 154 | 765 | 10 | -1 | -1 | -111 | 1522 |
| 0 | 5 | 1 | 31 | 5 | 3 | -2 | -7 | 4 | 2 | 6 | -10 | 3 | -463 | -78 | 10 | -1 | 0 | 553 | 1617 |
| 0 | 5 | 2 | 3 | 1 | 3 | -2 | -6 | -13 | -20 | 6 | -10 | 4 | -3 | 19 | 10 | -1 | 1 | 32 | 115 |
| 0 | 6 | -9 | 2 | 5 | 3 | -2 | -5 | -86 | 64 | 6 | -10 | 5 | 1 | 66 | 10 | -1 | 2 | 3 | 12 |
| 0 | 6 | -8 | 16 | 26 | 3 | -2 | -4 | -743 | 624 | 6 | -10 | 6 | -3 | -8 | 10 | -1 | 3 | -3 | -4 |
| 0 | 6 | -7 | 55 | 71 | 3 | -2 | -3 | -6009 | 4765 | 6 | -10 | 7 | 29 | 8 | 10 | 0 | -7 | 3 | -1 |
| 0 | 6 | -6 | -49 | 4 | 3 | -2 | -2 | -56633 | 42499 | 6 | -10 | 8 | 14 | 1 | 10 | 0 | -6 | 39 | -4 |
| 0 | 6 | -5 | 56 | 6 | 3 | -2 | -1 | -636608 | 389803 | 6 | -10 | 9 | -4 | -2 | 10 | 0 | -5 | 1 | -2 |
| 0 | 6 | -4 | -53 | 41 | 3 | -2 | 0 | -191426 | -1262883 | 6 | -9 | -4 | 2 | 7 | 10 | 0 | -4 | 32 | 35 |
| 0 | 6 | -3 | -1 | 4 | 3 | -2 | 1 | -775407 | 241330 | 6 | -9 | -3 | 17 | 57 | 10 | 0 | -3 | 91 | 10 |
| 0 | 6 | -2 | 389 | 110 | 3 | -2 | 2 | -139789 | -421626 | 6 | -9 | -2 | 155 | 516 | 10 | 0 | -2 | 202 | 333 |
| 0 | 6 | -1 | -89 | 250 | 3 | -2 | 3 | -29110 | -111039 | 6 | -9 | -1 | 1451 | 4875 | 10 | 0 | -1 | -190 | 197 |
| 0 | 6 | 0 | 368 | 136 | 3 | -2 | 4 | -4185 | -16772 | 6 | -9 | 0 | 15030 | 50770 | 10 | 0 | 0 | 18 | 278 |
| 0 | 6 | 1 | 31 | 17 | 3 | -2 | 5 | -583 | -2191 | 6 | -9 | 1 | -17151 | -21239 | 10 | 0 | 1 | 2 | 23 |
| 0 | 6 | 2 | 3 | 2 | 3 | -2 | 6 | -52 | -297 | 6 | -9 | 2 | 16713 | 56777 | 10 | 0 | 2 | -3 | 0 |
| 0 | 7 | -9 | -5 | -2 | 3 | -2 | 7 | -52 | 4 | 6 | -9 | 3 | -4390 | -2625 | 10 | 1 | -7 | 14 | -14 |
| 0 | 7 | -8 | 22 | 8 | 3 | -2 | 8 | 5 | -23 | 6 | -9 | 4 | -694 | -309 | 10 | 1 | -6 | 45 | -45 |
| 0 | 7 | -7 | -14 | 18 | 3 | -2 | 9 | -7 | 11 | 6 | -9 | 5 | -66 | -56 | 10 | 1 | -5 | 15 | 0 |
| 0 | 7 | -6 | 11 | -10 | 3 | -2 | 10 | 4 | -7 | 6 | -9 | 6 | -24 | -29 | 10 | 1 | -4 | 37 | -23 |
| 0 | 7 | -5 | -15 | 26 | 3 | -1 | -9 | -0 | -2 | 6 | -9 | 7 | 65 | -7 | 10 | 1 | -3 | 34 | 12 |
| 0 | 7 | -4 | -37 | -4 | 3 | -1 | -8 | -3 | -0 | 6 | -9 | 8 | -3 | 2 | 10 | 1 | -2 | 0 | 69 |
| 0 | 7 | -3 | 42 | 1 | 3 | -1 | -7 | -17 | -11 | 6 | -9 | 9 | -1 | 0 | 10 | 1 | -1 | -34 | 2 |
| 0 | 7 | -2 | 44 | -33 | 3 | -1 | -6 | -53 | 45 | 6 | -8 | -4 | 0 | 4 | 10 | 1 | 0 | -9 | 54 |
| 0 | 7 | -1 | 19 | 2 | 3 | -1 | -5 | -438 | 771 | 6 | -8 | -3 | 4 | 44 | 10 | 1 | 1 | 3 | 2 |
| 0 | 7 | 0 | 19 | -8 | 3 | -1 | -4 | -2994 | 6139 | 6 | -8 | -2 | 30 | 397 | 10 | 1 | 2 | -1 | -3 |
| 0 | 7 | 1 | 2 | -2 | 3 | -1 | -3 | -22471 | 48502 | 6 | -8 | -1 | 208 | 3853 | 10 | 2 | -8 | -1 | 4 |
| 0 | 8 | -9 | -10 | 4 | 3 | -1 | -2 | -137598 | 329531 | 6 | -8 | 0 | 2070 | 44546 | 10 | 2 | -7 | 1 | -23 |
| 0 | 8 | -8 | 2 | -10 | 3 | -1 | -1 | 155719 | -90328 | 6 | -8 | 1 | 10818 | 44672 | 10 | 2 | -6 | 16 | -2 |
| 0 | 8 | -7 | -5 | 10 | 3 | -1 | 0 | -436933 | 969181 | 6 | -8 | 2 | -507 | 34101 | 10 | 2 | -5 | -2 | -3 |
| 0 | 8 | -6 | 13 | -1 | 3 | -1 | 1 | 132991 | -26901 | 6 | -8 | 3 | 3681 | 16799 | 10 | 2 | -4 | 15 | -7 |
| 0 | 8 | -5 | 22 | -11 | 3 | -1 | 2 | 16218 | -8882 | 6 | -8 | 4 | 349 | 2110 | 10 | 2 | -3 | 9 | 36 |
| 0 | 8 | -4 | -7 | 13 | 3 | -1 | 3 | 1864 | -1178 | 6 | -8 | 5 | 51 | 258 | 10 | 2 | -2 | -11 | 75 |
| 0 | 8 | -3 | -3 | -1 | 3 | -1 | 4 | 201 | -105 | 6 | -8 | 6 | 34 | 9 | 10 | 2 | -1 | -7 | -8 |
| 0 | 9 | -9 | -5 | -1 | 3 | -1 | 5 | -6 | 14 | 6 | -8 | 7 | 23 | -21 | 10 | 2 | 0 | -8 | 73 |
| 0 | 9 | -8 | 1 | -4 | 3 | -1 | 6 | -0 | -2 | 6 | -8 | 8 | 6 | -6 | 10 | 2 | 1 | 0 | 6 |
| 0 | 9 | -7 | -5 | -1 | 3 | -1 | 7 | -9 | -21 | 6 | -7 | -3 | -20 | -0 | 10 | 3 | -8 | 6 | 9 |
| 0 | 9 | -6 | -2 | -3 | 3 | -1 | 8 | 0 | 14 | 6 | -7 | -2 | -214 | -53 | 10 | 3 | -7 | -2 | -3 |
| 0 | 9 | -4 | -3 | 1 | 3 | -1 | 9 | -1 | -4 | 6 | -7 | -1 | -2258 | -527 | 10 | 3 | -6 | 5 | 7 |
| 1 | -13 | 1 | -7 | -3 | 3 | -1 | 10 | 0 | 6 | 6 | -7 | 0 | -30866 | -5526 | 10 | 3 | -5 | 0 | 6 |
| 1 | -13 | 3 | -7 | -3 | 3 | 0 | -8 | -1 | 1 | 6 | -7 | 1 | -31629 | 1674 | 10 | 3 | -4 | -13 | -4 |
| 1 | -13 | 8 | -1 | -2 | 3 | 0 | -7 | -2 | 1 | 6 | -7 | 2 | -19049 | -5951 | 10 | 3 | -3 | 1 | -3 |
| 1 | -13 | 9 | 1 | -3 | 3 | 0 | -6 | 6 | 133 | 6 | -7 | 3 | -10524 | -285 | 10 | 4 | -9 | 3 | 1 |
| 1 | -13 | 10 | 3 | -0 | 3 | 0 | -5 | 228 | 639 | 6 | -7 | 4 | -1415 | -240 | 10 | 4 | -8 | 1 | 5 |
| 1 | -13 | 11 | 1 | -3 | 3 | 0 | -4 | 1487 | 4142 | 6 | -7 | 5 | -160 | -48 | 10 | 4 | -6 | 1 | 5 |
| 1 | -13 | 12 | 4 | 1 | 3 | 0 | -3 | 9777 | 25340 | 6 | -7 | 6 | -18 | -25 | 10 | 4 | -5 | -3 | -0 |
| 1 | -12 | 6 | -5 | 11 | 3 | 0 | -2 | 31650 | 96490 | 6 | -7 | 7 | -5 | -8 | 10 | 21 | -7 | 1 | 0 |
| 1 | -12 | 7 | -18 | -2 | 3 | 0 | -1 | 39905 | 72959 | 6 | -7 | 8 | -0 | -2 | 10 | 21 | -6 | 10 | 3 |
| 1 | -12 | 8 | 2 | -15 | 3 | 0 | 0 | 81185 | 238326 | 6 | -6 | -4 | 2 | -2 | 10 | 21 | -5 | 105 | 35 |
| 1 | -12 | 9 | -18 | 1 | 3 | 0 | 1 | 12741 | 18010 | 6 | -6 | -3 | 33 | -29 | 10 | 21 | -3 | 110 | 36 |
| 1 | -12 | 10 | 8 | -5 | 3 | 0 | 2 | 1338 | 1532 | 6 | -6 | -2 | 272 | -244 | 10 | 21 | -2 | 10 | 3 |
| 1 | -12 | 11 | 1 | -1 | 3 | 0 | 3 | 164 | 169 | 6 | -6 | -1 | 2383 | -2472 | 10 | 21 | -1 | 1 | 0 |

# Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -12 | 12 | 7 | 5 | 3 | 0 | 4 | 22 | 17 | 6 | -6 | 0 | 5083 | -28578 | 11 | -19 | 1 | -2 | -0 |
| 1 | -11 | 3 | 1 | -0 | 3 | 0 | 5 | -5 | -5 | 6 | -6 | 1 | 1335 | -24654 | 11 | -19 | 3 | -2 | -0 |
| 1 | -11 | 4 | 10 | -2 | 3 | 1 | -11 | -6 | 1 | 6 | -6 | 2 | 2455 | -17596 | 11 | -18 | 0 | 0 | -2 |
| 1 | -11 | 5 | 7 | 12 | 3 | 1 | -10 | 2 | 4 | 6 | -6 | 3 | -136 | -7432 | 11 | -18 | 1 | 2 | -20 |
| 1 | -11 | 6 | 25 | -8 | 3 | 1 | -9 | -8 | 5 | 6 | -6 | 4 | -158 | -1301 | 11 | -18 | 3 | 3 | -25 |
| 1 | -11 | 7 | 27 | 28 | 3 | 1 | -8 | 4 | 8 | 6 | -6 | 5 | -25 | -193 | 11 | -18 | 4 | 0 | -2 |
| 1 | -11 | 8 | -13 | 1 | 3 | 1 | -7 | -44 | 49 | 6 | -6 | 6 | -20 | -40 | 11 | -17 | -2 | 3 | 1 |
| 1 | -11 | 9 | -3 | 5 | 3 | 1 | -6 | 71 | 96 | 6 | -6 | 7 | -5 | -9 | 11 | -17 | -1 | 30 | 14 |
| 1 | -11 | 10 | -8 | 23 | 3 | 1 | -5 | -41 | 184 | 6 | -5 | -5 | -1 | 1 | 11 | -17 | 0 | 291 | 135 |
| 1 | -11 | 11 | -20 | -1 | 3 | 1 | -4 | -960 | -136 | 6 | -5 | -4 | -5 | 8 | 11 | -17 | 1 | 3091 | 1398 |
| 1 | -11 | 12 | 7 | 2 | 3 | 1 | -3 | -14890 | -4972 | 6 | -5 | -3 | -26 | 89 | 11 | -17 | 2 | 100 | 2 |
| 1 | -10 | 1 | 5 | -2 | 3 | 1 | -2 | -12266 | 67 | 6 | -5 | -2 | -176 | 708 | 11 | -17 | 3 | 3058 | 1387 |
| 1 | -10 | 2 | 4 | 1 | 3 | 1 | -1 | -55558 | -24107 | 6 | -5 | -1 | -906 | 5279 | 11 | -17 | 4 | 315 | 125 |
| 1 | -10 | 3 | -3 | -0 | 3 | 1 | 0 | -61614 | -17141 | 6 | -5 | 0 | -8840 | 3933 | 11 | -17 | 5 | 34 | 13 |
| 1 | -10 | 4 | 17 | -2 | 3 | 1 | 1 | -4385 | -1195 | 6 | -5 | 1 | -15688 | 1813 | 11 | -17 | 6 | 3 | 1 |
| 1 | -10 | 5 | 6 | -7 | 3 | 1 | 2 | -401 | -98 | 6 | -5 | 2 | -3523 | 2627 | 11 | -16 | 1 | -7 | 1 |
| 1 | -10 | 6 | 21 | 13 | 3 | 1 | 3 | -22 | -51 | 6 | -5 | 3 | -3615 | -898 | 11 | -16 | 3 | -7 | 1 |
| 1 | -10 | 7 | -8 | 14 | 3 | 1 | 4 | -28 | 4 | 6 | -5 | 4 | -567 | -191 | 11 | -15 | 0 | -2 | -2 |
| 1 | -10 | 8 | -1 | 14 | 3 | 1 | 5 | -11 | -9 | 6 | -5 | 5 | -71 | -12 | 11 | -15 | 1 | -23 | -23 |
| 1 | -10 | 9 | -11 | 1 | 3 | 1 | 6 | -4 | 2 | 6 | -5 | 6 | -14 | -1 | 11 | -15 | 3 | -16 | -15 |
| 1 | -10 | 10 | -48 | 14 | 3 | 1 | 7 | -9 | -1 | 6 | -5 | 7 | -3 | -1 | 11 | -15 | 4 | -2 | -2 |
| 1 | -10 | 11 | -18 | 5 | 3 | 2 | -11 | 10 | -8 | 6 | -4 | -6 | 1 | -1 | 11 | -14 | 0 | -5 | -4 |
| 1 | -10 | 12 | -2 | 1 | 3 | 2 | -10 | -1 | -4 | 6 | -4 | -5 | 4 | -3 | 11 | -14 | 1 | -68 | -74 |
| 1 | -9 | 0 | 2 | -1 | 3 | 2 | -9 | 6 | -1 | 6 | -4 | -4 | -22 | 8 | 11 | -14 | 2 | 7 | 46 |
| 1 | -9 | 2 | -2 | 2 | 3 | 2 | -8 | 5 | -14 | 6 | -4 | -3 | -151 | -190 | 11 | -14 | 3 | -36 | -44 |
| 1 | -9 | 3 | -7 | -2 | 3 | 2 | -7 | 45 | 28 | 6 | -4 | -2 | -1565 | -686 | 11 | -14 | 4 | -4 | 6 |
| 1 | -9 | 4 | 4 | -28 | 3 | 2 | -6 | -1 | -45 | 6 | -4 | -1 | -10176 | -2076 | 11 | -14 | 5 | 6 | 5 |
| 1 | -9 | 5 | 66 | 5 | 3 | 2 | -5 | 250 | -177 | 6 | -4 | 0 | 8040 | -5482 | 11 | -13 | -1 | 0 | 1 |
| 1 | -9 | 6 | 15 | 49 | 3 | 2 | -4 | -573 | -465 | 6 | -4 | 1 | -14096 | -2702 | 11 | -13 | 0 | -10 | -8 |
| 1 | -9 | 7 | -35 | 28 | 3 | 2 | -3 | 2216 | -5331 | 6 | -4 | 2 | 3204 | -1753 | 11 | -13 | 1 | -240 | -396 |
| 1 | -9 | 8 | -18 | 9 | 3 | 2 | -2 | -12660 | -2118 | 6 | -4 | 3 | 418 | -211 | 11 | -13 | 2 | -56 | 51 |
| 1 | -9 | 9 | -15 | 8 | 3 | 2 | -1 | -5984 | -15714 | 6 | -4 | 4 | 64 | -70 | 11 | -13 | 3 | -108 | -167 |
| 1 | -9 | 10 | -25 | 41 | 3 | 2 | 0 | -10432 | -11380 | 6 | -4 | 5 | 6 | -9 | 11 | -13 | 4 | -36 | -20 |
| 1 | -9 | 11 | -1 | 1 | 3 | 2 | 1 | -802 | -838 | 6 | -4 | 6 | 1 | 0 | 11 | -13 | 5 | -8 | 5 |
| 1 | -9 | 12 | -1 | 1 | 3 | 2 | 2 | -87 | -46 | 6 | -3 | -6 | -1 | 2 | 11 | -12 | -2 | -3 | 1 |
| 1 | -8 | -1 | -2 | -1 | 3 | 2 | 3 | 12 | -35 | 6 | -3 | -5 | -0 | 10 | 11 | -12 | -1 | -25 | 11 |
| 1 | -8 | 0 | -11 | -9 | 3 | 2 | 4 | -18 | 14 | 6 | -3 | -4 | 14 | 19 | 11 | -12 | 0 | -189 | 65 |
| 1 | -8 | 1 | -23 | -29 | 3 | 2 | 5 | 28 | -18 | 6 | -3 | -3 | 149 | 85 | 11 | -12 | 1 | 1147 | -738 |
| 1 | -8 | 2 | -50 | 7 | 3 | 2 | 6 | -3 | 2 | 6 | -3 | -2 | 533 | 1269 | 11 | -12 | 2 | -388 | 105 |
| 1 | -8 | 3 | -56 | -109 | 3 | 2 | 7 | 2 | -1 | 6 | -3 | -1 | -15869 | 21088 | 11 | -12 | 3 | 402 | -273 |
| 1 | -8 | 4 | 141 | -139 | 3 | 3 | -11 | 1 | -1 | 6 | -3 | 0 | 5652 | -1117 | 11 | -12 | 4 | 54 | -57 |
| 1 | -8 | 5 | 277 | 93 | 3 | 3 | -10 | 5 | -2 | 6 | -3 | 1 | -16590 | 22824 | 11 | -12 | 5 | 3 | -11 |
| 1 | -8 | 6 | 14 | 186 | 3 | 3 | -9 | 28 | -14 | 6 | -3 | 2 | -1948 | 2579 | 11 | -11 | -4 | -1 | -2 |
| 1 | -8 | 7 | 20 | 33 | 3 | 3 | -8 | 40 | -18 | 6 | -3 | 3 | -212 | 290 | 11 | -11 | -3 | -3 | -15 |
| 1 | -8 | 8 | 24 | 20 | 3 | 3 | -7 | 111 | -71 | 6 | -3 | 4 | -32 | 15 | 11 | -11 | -2 | -26 | -135 |
| 1 | -8 | 9 | 7 | 25 | 3 | 3 | -6 | 109 | -49 | 6 | -3 | 5 | -3 | 5 | 11 | -11 | -1 | -213 | -1282 |
| 1 | -8 | 10 | 3 | 27 | 3 | 3 | -5 | 60 | -47 | 6 | -3 | 6 | -4 | -5 | 11 | -11 | 0 | -1436 | -13666 |
| 1 | -8 | 11 | 0 | 2 | 3 | 3 | -4 | 535 | -944 | 6 | -2 | -7 | -5 | 4 | 11 | -11 | 1 | 1817 | 5471 |
| 1 | -8 | 12 | 0 | 2 | 3 | 3 | -3 | -73 | 614 | 6 | -2 | -6 | -35 | 84 | 11 | -11 | 2 | -1671 | -14919 |
| 1 | -7 | -3 | -5 | -4 | 3 | 3 | -2 | -2591 | -2516 | 6 | -2 | -5 | 30 | 556 | 11 | -11 | 3 | 548 | 470 |
| 1 | -7 | -2 | -40 | -34 | 3 | 3 | -1 | 1311 | -2834 | 6 | -2 | -4 | 50 | 4072 | 11 | -11 | 4 | 96 | 118 |
| 1 | -7 | -1 | -373 | -328 | 3 | 3 | 0 | -985 | -2610 | 6 | -2 | -3 | 925 | 32010 | 11 | -11 | 5 | 15 | 15 |
| 1 | -7 | 0 | -3875 | -3454 | 3 | 3 | 1 | -43 | -243 | 6 | -2 | -2 | 17056 | 218821 | 11 | -11 | 6 | 1 | 2 |
| 1 | -7 | 1 | 294 | -1754 | 3 | 3 | 2 | -11 | -18 | 6 | -2 | -1 | 153178 | 134582 | 11 | -10 | -3 | 3 | 2 |
| 1 | -7 | 2 | -4544 | -3618 | 3 | 3 | 3 | 2 | -3 | 6 | -2 | 0 | 22613 | 593318 | 11 | -10 | -2 | 25 | 17 |
| 1 | -7 | 3 | -238 | -1676 | 3 | 3 | 4 | -7 | 0 | 6 | -2 | 1 | 148029 | 156262 | 11 | -10 | -1 | 264 | 159 |
| 1 | -7 | 4 | 942 | -361 | 3 | 3 | 5 | 1 | -1 | 6 | -2 | 2 | 18986 | 17050 | 11 | -10 | 0 | 2402 | 568 |
| 1 | -7 | 5 | 429 | 549 | 3 | 4 | -10 | -2 | 4 | 6 | -2 | 3 | 2195 | 1880 | 11 | -10 | 1 | 1443 | 166 |
| 1 | -7 | 6 | 105 | 45 | 3 | 4 | -9 | 4 | -22 | 6 | -2 | 4 | 254 | 216 | 11 | -10 | 2 | 1992 | 538 |
| 1 | -7 | 7 | 95 | 41 | 3 | 4 | -8 | -8 | 10 | 6 | -2 | 5 | 32 | 22 | 11 | -10 | 3 | 620 | 28 |
| 1 | -7 | 8 | 54 | 32 | 3 | 4 | -7 | 33 | -2 | 6 | -2 | 6 | 4 | 3 | 11 | -10 | 4 | 75 | 8 |
| 1 | -7 | 9 | 43 | 41 | 3 | 4 | -6 | 14 | -49 | 6 | -1 | -8 | -3 | 1 | 11 | -10 | 5 | 10 | 4 |
| 1 | -7 | 10 | 1 | 2 | 3 | 4 | -5 | 42 | -230 | 6 | -1 | -7 | -0 | 5 | 11 | -9 | -3 | -1 | -2 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -7 | 11 | 4 | 4 | 3 | 4 | -4 | 255 | 298 | 6 | -1 | -6 | -59 | 6 | 11 | -9 | -2 | -5 | 7 |
| 1 | -6 | -3 | -6 | -10 | 3 | 4 | -3 | -272 | 65 | 6 | -1 | -5 | 21 | 12 | 11 | -9 | -1 | -127 | 58 |
| 1 | -6 | -2 | -101 | -82 | 3 | 4 | -2 | -258 | -823 | 6 | -1 | -4 | -100 | 53 | 11 | -9 | 0 | -235 | 382 |
| 1 | -6 | -1 | -878 | -824 | 3 | 4 | -1 | 553 | -196 | 6 | -1 | -3 | 231 | -1016 | 11 | -9 | 1 | -292 | 372 |
| 1 | -6 | 0 | -9627 | -9348 | 3 | 4 | 0 | -89 | -657 | 6 | -1 | -2 | -1097 | 156 | 11 | -9 | 2 | -207 | 252 |
| 1 | -6 | 1 | -6442 | 4636 | 3 | 4 | 1 | -4 | -51 | 6 | -1 | -1 | -310 | -3322 | 11 | -9 | 3 | -47 | 129 |
| 1 | -6 | 2 | -9762 | -10890 | 3 | 4 | 2 | 7 | -6 | 6 | -1 | 0 | -1046 | -4627 | 11 | -9 | 4 | -10 | 8 |
| 1 | -6 | 3 | -54 | -2666 | 3 | 4 | 3 | 1 | -0 | 6 | -1 | 1 | -103 | -391 | 11 | -9 | 5 | -2 | 1 |
| 1 | -6 | 4 | 2285 | 857 | 3 | 4 | 4 | -2 | -0 | 6 | -1 | 2 | -18 | -38 | 11 | -8 | -3 | -1 | -3 |
| 1 | -6 | 5 | 330 | -247 | 3 | 5 | -12 | -1 | -2 | 6 | -1 | 3 | 1 | -3 | 11 | -8 | -2 | -6 | 0 |
| 1 | -6 | 6 | 171 | -3 | 3 | 5 | -11 | -3 | -8 | 6 | 0 | -8 | -4 | 1 | 11 | -8 | -1 | -17 | -105 |
| 1 | -6 | 7 | 44 | 7 | 3 | 5 | -10 | 3 | 9 | 6 | 0 | -7 | -2 | -3 | 11 | -8 | 0 | -154 | -119 |
| 1 | -6 | 8 | 41 | 0 | 3 | 5 | -9 | -12 | -29 | 6 | 0 | -6 | 4 | -14 | 11 | -8 | 1 | -181 | -168 |
| 1 | -6 | 9 | 22 | 4 | 3 | 5 | -8 | -19 | -20 | 6 | 0 | -5 | -64 | 47 | 11 | -8 | 2 | -98 | -90 |
| 1 | -6 | 10 | 2 | -1 | 3 | 5 | -7 | -15 | -24 | 6 | 0 | -4 | 13 | 29 | 11 | -8 | 3 | -65 | -19 |
| 1 | -5 | -3 | -20 | -22 | 3 | 5 | -6 | -30 | -58 | 6 | 0 | -3 | -74 | 310 | 11 | -8 | 4 | -15 | 0 |
| 1 | -5 | -2 | -173 | -222 | 3 | 5 | -5 | 49 | 10 | 6 | 0 | -2 | 472 | 803 | 11 | -7 | -3 | 1 | 5 |
| 1 | -5 | -1 | -1607 | -2250 | 3 | 5 | -4 | -31 | 53 | 6 | 0 | -1 | -500 | 1130 | 11 | -7 | -2 | 4 | -5 |
| 1 | -5 | 0 | -19746 | -27738 | 3 | 5 | -3 | 64 | -399 | 6 | 0 | 0 | -103 | 1495 | 11 | -7 | -1 | 74 | 40 |
| 1 | -5 | 1 | -32435 | -4216 | 3 | 5 | -2 | -429 | -5010 | 6 | 0 | 1 | -9 | 77 | 11 | -7 | 0 | 57 | 18 |
| 1 | -5 | 2 | -12264 | -39136 | 3 | 5 | -1 | 539 | 295 | 6 | 0 | 2 | 1 | 9 | 11 | -7 | 1 | 36 | 64 |
| 1 | -5 | 3 | 3556 | -6870 | 3 | 5 | 0 | -410 | -5042 | 6 | 0 | 3 | -0 | -8 | 11 | -7 | 2 | 35 | 13 |
| 1 | -5 | 4 | -779 | -3314 | 3 | 5 | 1 | -35 | -462 | 6 | 1 | -8 | 3 | 4 | 11 | -7 | 3 | -18 | 15 |
| 1 | -5 | 5 | 843 | -819 | 3 | 5 | 2 | -3 | -48 | 6 | 1 | -7 | -3 | 18 | 11 | -7 | 4 | -2 | 1 |
| 1 | -5 | 6 | 219 | -121 | 3 | 5 | 3 | -1 | -5 | 6 | 1 | -6 | 50 | 1 | 11 | -6 | -4 | 1 | 1 |
| 1 | -5 | 7 | 7 | -20 | 3 | 6 | -11 | -1 | -1 | 6 | 1 | -5 | -18 | 45 | 11 | -6 | -3 | -4 | 4 |
| 1 | -5 | 8 | 19 | -14 | 3 | 6 | -10 | -23 | -8 | 6 | 1 | -4 | -16 | 64 | 11 | -6 | -2 | -5 | 6 |
| 1 | -5 | 9 | 6 | -2 | 3 | 6 | -9 | -38 | -11 | 6 | 1 | -3 | 31 | -12 | 11 | -6 | -1 | -50 | 86 |
| 1 | -5 | 10 | 1 | -1 | 3 | 6 | -8 | -0 | -1 | 6 | 1 | -2 | -23 | 310 | 11 | -6 | 0 | 13 | -47 |
| 1 | -4 | -7 | -3 | -0 | 3 | 6 | -7 | -5 | 0 | 6 | 1 | -1 | -255 | 91 | 11 | -6 | 1 | -51 | 93 |
| 1 | -4 | -6 | -4 | 3 | 3 | 6 | -6 | -6 | -15 | 6 | 1 | 0 | -157 | 198 | 11 | -6 | 2 | 4 | -16 |
| 1 | -4 | -5 | -13 | -1 | 3 | 6 | -5 | 20 | 22 | 6 | 1 | 1 | -6 | 16 | 11 | -6 | 3 | 3 | -1 |
| 1 | -4 | -4 | 26 | -8 | 3 | 6 | -4 | -22 | 11 | 6 | 1 | 2 | -4 | -2 | 11 | -5 | -4 | 0 | 1 |
| 1 | -4 | -3 | -48 | -123 | 3 | 6 | -3 | 0 | -15 | 6 | 1 | 3 | 2 | -2 | 11 | -5 | -3 | -1 | -5 |
| 1 | -4 | -2 | -403 | -1126 | 3 | 6 | -2 | 6 | -4 | 6 | 2 | -8 | -2 | 3 | 11 | -5 | -2 | 6 | -16 |
| 1 | -4 | -1 | -4098 | -11821 | 3 | 6 | -1 | -38 | -15 | 6 | 2 | -7 | 4 | -20 | 11 | -5 | -1 | 78 | 125 |
| 1 | -4 | 0 | -53231 | -154002 | 3 | 6 | 0 | 1 | -1 | 6 | 2 | -6 | 23 | 30 | 11 | -5 | 0 | 24 | -57 |
| 1 | -4 | 1 | -110139 | -125381 | 3 | 6 | 1 | -3 | 2 | 6 | 2 | -5 | -7 | 14 | 11 | -5 | 1 | 76 | 134 |
| 1 | -4 | 2 | 17254 | -144886 | 3 | 7 | -11 | 8 | -1 | 6 | 2 | -4 | 11 | -15 | 11 | -5 | 2 | 15 | 18 |
| 1 | -4 | 3 | -28598 | -40337 | 3 | 7 | -10 | -21 | 8 | 6 | 2 | -3 | 35 | 40 | 11 | -5 | 3 | 1 | 2 |
| 1 | -4 | 4 | 710 | -12810 | 3 | 7 | -9 | 18 | -19 | 6 | 2 | -2 | -35 | 56 | 11 | -4 | -4 | 10 | 6 |
| 1 | -4 | 5 | 459 | -2223 | 3 | 7 | -8 | 10 | -0 | 6 | 2 | -1 | -25 | -24 | 11 | -4 | -3 | 65 | 44 |
| 1 | -4 | 6 | 124 | -277 | 3 | 7 | -7 | -4 | -6 | 6 | 2 | 0 | -27 | 21 | 11 | -4 | -2 | 329 | 149 |
| 1 | -4 | 7 | -4 | -32 | 3 | 7 | -6 | 26 | -1 | 6 | 2 | 1 | 2 | -3 | 11 | -4 | -1 | 292 | -108 |
| 1 | -4 | 8 | 8 | -16 | 3 | 7 | -5 | 22 | 31 | 6 | 3 | -8 | -1 | 5 | 11 | -4 | 0 | 941 | 465 |
| 1 | -4 | 9 | 1 | -2 | 3 | 7 | -4 | -7 | 25 | 6 | 3 | -7 | -4 | -19 | 11 | -4 | 1 | 268 | -102 |
| 1 | -3 | -9 | -1 | 2 | 3 | 7 | -3 | 11 | 3 | 6 | 3 | -6 | 18 | 4 | 11 | -4 | 2 | 37 | -19 |
| 1 | -3 | -8 | -5 | -2 | 3 | 7 | -2 | 0 | 6 | 6 | 3 | -5 | -12 | -21 | 11 | -4 | 3 | -3 | -4 |
| 1 | -3 | -7 | 29 | 11 | 3 | 8 | -11 | 4 | -3 | 6 | 3 | -4 | 12 | -16 | 11 | -3 | -5 | 0 | -5 |
| 1 | -3 | -6 | -20 | -14 | 3 | 8 | -10 | -2 | -12 | 6 | 3 | -3 | 1 | 9 | 11 | -3 | -4 | 12 | 1 |
| 1 | -3 | -5 | 80 | 15 | 3 | 8 | -9 | 17 | -1 | 6 | 3 | -2 | -23 | -11 | 11 | -3 | -3 | -3 | 12 |
| 1 | -3 | -4 | -5 | -67 | 3 | 8 | -8 | -22 | -11 | 6 | 3 | -1 | -5 | -4 | 11 | -3 | -2 | 14 | 23 |
| 1 | -3 | -3 | -17 | -469 | 3 | 8 | -7 | -18 | -6 | 6 | 3 | 0 | -6 | 2 | 11 | -3 | -1 | -42 | 52 |
| 1 | -3 | -2 | 59 | -4404 | 3 | 8 | -6 | -14 | 12 | 6 | 4 | -9 | 2 | 1 | 11 | -3 | 0 | -21 | 70 |
| 1 | -3 | -1 | 1122 | -48048 | 3 | 8 | -5 | -17 | -12 | 6 | 4 | -8 | -6 | 1 | 11 | -3 | 1 | -8 | 4 |
| 1 | -3 | 0 | 30451 | -662811 | 3 | 8 | -4 | -2 | 1 | 6 | 4 | -7 | -6 | -9 | 11 | -3 | 3 | -0 | 1 |
| 1 | -3 | 1 | -24182 | -620071 | 3 | 8 | -3 | -4 | -1 | 6 | 4 | -6 | -9 | -1 | 11 | -2 | -10 | 0 | 3 |
| 1 | -3 | 2 | 14365 | -308997 | 3 | 9 | -12 | 1 | -2 | 6 | 4 | -5 | -8 | -9 | 11 | -2 | -9 | -4 | 7 |
| 1 | -3 | 3 | -2536 | -165903 | 3 | 9 | -11 | 4 | 3 | 6 | 4 | -4 | 9 | -13 | 11 | -2 | -8 | 10 | 26 |
| 1 | -3 | 4 | -822 | -26060 | 3 | 9 | -10 | -3 | 2 | 6 | 4 | -3 | -1 | -0 | 11 | -2 | -7 | -5 | 45 |
| 1 | -3 | 5 | -46 | -3494 | 3 | 9 | -9 | 2 | 1 | 6 | 4 | -2 | -33 | 21 | 11 | -2 | -6 | -30 | 26 |
| 1 | -3 | 6 | 49 | -458 | 3 | 9 | -8 | -4 | 6 | 6 | 4 | -1 | -4 | 5 | 11 | -2 | -5 | 49 | 17 |
| 1 | -3 | 7 | 67 | -24 | 3 | 9 | -7 | -2 | -2 | 6 | 4 | 0 | -37 | 22 | 11 | -2 | -4 | -270 | 90 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -3 | 8 | 12 | -27 | 3 | 9 | -6 | 3 | -7 | 6 | 4 | 1 | -3 | 1 | 11 | -2 | -3 | 4 | -598 |
| 1 | -3 | 9 | 13 | 2 | 3 | 10 | -10 | -1 | -1 | 6 | 5 | -9 | 3 | -0 | 11 | -2 | -2 | -210 | 727 |
| 1 | -3 | 10 | -3 | 1 | 3 | 10 | -8 | -1 | -1 | 6 | 5 | -8 | 2 | 3 | 11 | -2 | -1 | -1056 | -494 |
| 1 | -3 | 11 | 3 | 0 | 4 | -14 | 6 | -2 | 1 | 6 | 5 | -7 | 1 | -0 | 11 | -2 | 0 | -1039 | -94 |
| 1 | -2 | -11 | 3 | 3 | 4 | -14 | 7 | -3 | -2 | 6 | 5 | -6 | 3 | 2 | 11 | -2 | 1 | -76 | -7 |
| 1 | -2 | -10 | -3 | -3 | 4 | -14 | 8 | 0 | -4 | 6 | 5 | -5 | -5 | 1 | 11 | -2 | 2 | -9 | 2 |
| 1 | -2 | -9 | 18 | 17 | 4 | -14 | 9 | -1 | -3 | 6 | 5 | -4 | 1 | -1 | 11 | -1 | -5 | -1 | 1 |
| 1 | -2 | -8 | -3 | -2 | 4 | -14 | 10 | 2 | -5 | 6 | 5 | -3 | -16 | 5 | 11 | -1 | -1 | 1 | -1 |
| 1 | -2 | -7 | 19 | 17 | 4 | -14 | 11 | 2 | -1 | 6 | 5 | -1 | -3 | 1 | 11 | 0 | -3 | -0 | -1 |
| 1 | -2 | -6 | -26 | -21 | 4 | -13 | 4 | 4 | -0 | 6 | 6 | -6 | -2 | 1 | 11 | 0 | -1 | -0 | -1 |
| 1 | -2 | -5 | -9 | 16 | 4 | -13 | 5 | 0 | 4 | 6 | 6 | -4 | 4 | -3 | 11 | 20 | -5 | -0 | 8 |
| 1 | -2 | -4 | -79 | 23 | 4 | -13 | 6 | 3 | -2 | 7 | -16 | 1 | 2 | 2 | 11 | 20 | -3 | -0 | 8 |
| 1 | -2 | -3 | -474 | 332 | 4 | -13 | 7 | 3 | 9 | 7 | -16 | 3 | 2 | 2 | 11 | 21 | -7 | 2 | 2 |
| 1 | -2 | -2 | -3792 | 3374 | 4 | -13 | 8 | 14 | -4 | 7 | -15 | 1 | -2 | 3 | 11 | 21 | -6 | 23 | 24 |
| 1 | -2 | -1 | -25721 | 35902 | 4 | -13 | 9 | 3 | 6 | 7 | -15 | 3 | -2 | 3 | 11 | 21 | -5 | 243 | 253 |
| 1 | -2 | 0 | 141031 | 217437 | 4 | -13 | 10 | 9 | -6 | 7 | -14 | 4 | -2 | -0 | 11 | 21 | -3 | 233 | 242 |
| 1 | -2 | 1 | -122946 | -25800 | 4 | -13 | 11 | 4 | 4 | 7 | -14 | 5 | 1 | -1 | 11 | 21 | -2 | 23 | 24 |
| 1 | -2 | 2 | 89233 | 97271 | 4 | -12 | 2 | 3 | 3 | 7 | -14 | 6 | -2 | 2 | 11 | 21 | -1 | 2 | 2 |
| 1 | -2 | 3 | -6531 | 4980 | 4 | -12 | 3 | -0 | -1 | 7 | -14 | 7 | 1 | -1 | 12 | -19 | 1 | -9 | -6 |
| 1 | -2 | 4 | 1148 | -284 | 4 | -12 | 4 | 2 | 13 | 7 | -14 | 8 | 1 | 2 | 12 | -19 | 3 | -12 | -8 |
| 1 | -2 | 5 | 217 | -22 | 4 | -12 | 5 | 35 | -17 | 7 | -13 | 2 | 0 | -14 | 12 | -18 | -1 | 1 | -2 |
| 1 | -2 | 6 | -14 | -11 | 4 | -12 | 6 | 16 | 29 | 7 | -13 | 3 | -10 | -1 | 12 | -18 | 0 | 10 | -16 |
| 1 | -2 | 7 | 20 | -25 | 4 | -12 | 7 | 3 | -3 | 7 | -13 | 4 | 1 | -20 | 12 | -18 | 1 | 102 | -156 |
| 1 | -2 | 8 | 4 | 21 | 4 | -12 | 8 | -12 | -16 | 7 | -13 | 5 | 5 | -3 | 12 | -18 | 3 | 116 | -177 |
| 1 | -2 | 9 | 13 | 4 | 4 | -12 | 9 | -4 | 25 | 7 | -13 | 6 | -9 | -4 | 12 | -18 | 4 | 10 | -16 |
| 1 | -2 | 10 | -17 | -9 | 4 | -12 | 10 | 6 | -6 | 7 | -13 | 7 | 8 | -4 | 12 | -18 | 5 | 1 | -2 |
| 1 | -2 | 11 | 7 | 1 | 4 | -12 | 11 | 11 | 2 | 7 | -13 | 8 | -6 | 3 | 12 | -17 | 0 | 2 | 6 |
| 1 | -2 | 12 | -2 | -0 | 4 | -11 | 1 | -1 | 0 | 7 | -13 | 9 | -1 | -2 | 12 | -17 | 1 | 31 | 73 |
| 1 | -1 | -9 | -5 | -1 | 4 | -11 | 2 | 1 | 4 | 7 | -12 | -1 | -3 | 1 | 12 | -17 | 3 | 29 | 67 |
| 1 | -1 | -8 | -2 | -15 | 4 | -11 | 3 | -6 | -6 | 7 | -12 | 0 | 4 | 2 | 12 | -17 | 4 | 2 | 6 |
| 1 | -1 | -7 | -9 | -16 | 4 | -11 | 4 | 24 | -16 | 7 | -12 | 1 | -40 | 29 | 12 | -16 | 0 | -2 | 1 |
| 1 | -1 | -6 | -24 | -27 | 4 | -11 | 5 | 20 | 19 | 7 | -12 | 2 | 41 | 1 | 12 | -16 | 1 | -29 | 16 |
| 1 | -1 | -5 | -210 | -49 | 4 | -11 | 6 | 9 | 25 | 7 | -12 | 3 | -1 | 39 | 12 | -16 | 3 | -22 | 12 |
| 1 | -1 | -4 | -1647 | -348 | 4 | -11 | 7 | -26 | 30 | 7 | -12 | 4 | -10 | -5 | 12 | -16 | 4 | -2 | 1 |
| 1 | -1 | -3 | -14195 | -3214 | 4 | -11 | 8 | -11 | 55 | 7 | -12 | 5 | 21 | -2 | 12 | -15 | 0 | -3 | 1 |
| 1 | -1 | -2 | -124334 | -26440 | 4 | -11 | 9 | -30 | 24 | 7 | -12 | 6 | 0 | 20 | 12 | -15 | 1 | -64 | 30 |
| 1 | -1 | -1 | -1032425 | -157457 | 4 | -11 | 10 | 12 | 2 | 7 | -12 | 7 | 10 | -18 | 12 | -15 | 2 | 24 | -1 |
| 1 | -1 | 0 | -100702 | 20160 | 4 | -11 | 11 | 5 | -2 | 7 | -12 | 8 | -1 | -4 | 12 | -15 | 3 | -44 | 20 |
| 1 | -1 | 1 | -1143039 | -181209 | 4 | -10 | 0 | -4 | -3 | 7 | -12 | 9 | 5 | -2 | 12 | -15 | 4 | 3 | 1 |
| 1 | -1 | 2 | -111398 | 6350 | 4 | -10 | 1 | -5 | -25 | 7 | -11 | -1 | 6 | -0 | 12 | -14 | -1 | 1 | 0 |
| 1 | -1 | 3 | -11674 | 1658 | 4 | -10 | 2 | -47 | 3 | 7 | -11 | 0 | 37 | 11 | 12 | -14 | 0 | -9 | 4 |
| 1 | -1 | 4 | -1361 | 205 | 4 | -10 | 3 | -13 | -90 | 7 | -11 | 1 | -230 | 178 | 12 | -14 | 1 | -183 | 68 |
| 1 | -1 | 5 | -155 | 26 | 4 | -10 | 4 | 81 | -75 | 7 | -11 | 2 | 292 | 64 | 12 | -14 | 2 | 8 | 40 |
| 1 | -1 | 6 | -30 | 20 | 4 | -10 | 5 | 96 | 35 | 7 | -11 | 3 | -88 | 186 | 12 | -14 | 3 | -90 | 32 |
| 1 | -1 | 7 | -18 | 27 | 4 | -10 | 6 | 10 | 12 | 7 | -11 | 4 | 36 | -18 | 12 | -14 | 4 | -13 | 17 |
| 1 | -1 | 8 | -20 | 18 | 4 | -10 | 7 | -10 | 16 | 7 | -11 | 5 | 53 | 82 | 12 | -14 | 5 | 2 | 5 |
| 1 | -1 | 9 | -3 | 5 | 4 | -10 | 8 | 22 | 5 | 7 | -11 | 6 | -40 | -10 | 12 | -13 | -1 | 1 | 4 |
| 1 | -1 | 10 | -8 | 7 | 4 | -10 | 9 | -35 | 53 | 7 | -11 | 7 | 13 | -1 | 12 | -13 | 0 | -3 | 11 |
| 1 | -1 | 11 | 6 | -1 | 4 | -10 | 10 | 3 | -4 | 7 | -11 | 8 | -13 | 11 | 12 | -13 | 1 | -193 | -512 |
| 1 | 0 | -8 | 5 | -7 | 4 | -9 | -2 | -3 | -2 | 7 | -11 | 9 | 2 | -9 | 12 | -13 | 2 | -17 | 77 |
| 1 | 0 | -7 | -17 | 0 | 4 | -9 | -1 | -26 | -17 | 7 | -10 | -3 | 3 | -0 | 12 | -13 | 3 | -80 | -205 |
| 1 | 0 | -6 | 7 | -9 | 4 | -9 | 0 | -227 | -176 | 7 | -10 | -2 | 21 | -1 | 12 | -13 | 4 | -22 | -32 |
| 1 | 0 | -5 | -190 | 134 | 4 | -9 | 1 | 286 | -437 | 7 | -10 | -1 | 187 | 4 | 12 | -13 | 5 | -4 | -0 |
| 1 | 0 | -4 | -1638 | 1032 | 4 | -9 | 2 | -660 | -346 | 7 | -10 | 0 | 1748 | 26 | 12 | -12 | -2 | -5 | 2 |
| 1 | 0 | -3 | -13114 | 8058 | 4 | -9 | 3 | 183 | -629 | 7 | -10 | 1 | -3974 | 1574 | 12 | -12 | -1 | -48 | 5 |
| 1 | 0 | -2 | -95211 | 60114 | 4 | -9 | 4 | 364 | -45 | 7 | -10 | 2 | 2912 | 294 | 12 | -12 | 0 | -454 | -54 |
| 1 | 0 | -1 | -11965 | 87770 | 4 | -9 | 5 | -12 | 131 | 7 | -10 | 3 | -1395 | 547 | 12 | -12 | 1 | 1058 | -126 |
| 1 | 0 | 0 | -266780 | 160175 | 4 | -9 | 6 | 25 | 12 | 7 | -10 | 4 | -70 | 155 | 12 | -12 | 2 | -651 | -69 |
| 1 | 0 | 1 | -31877 | 93078 | 4 | -9 | 7 | 13 | 27 | 7 | -10 | 5 | 18 | 60 | 12 | -12 | 3 | 322 | -65 |
| 1 | 0 | 2 | -3495 | 12981 | 4 | -9 | 8 | 11 | 8 | 7 | -10 | 6 | -16 | -6 | 12 | -12 | 4 | 51 | -16 |
| 1 | 0 | 3 | -342 | 1452 | 4 | -9 | 9 | 7 | 43 | 7 | -10 | 7 | 10 | 32 | 12 | -12 | 5 | 5 | -2 |
| 1 | 0 | 4 | -96 | 208 | 4 | -9 | 10 | -0 | 3 | 7 | -10 | 8 | -8 | -19 | 12 | -11 | -4 | 2 | -3 |
| 1 | 0 | 5 | 42 | -18 | 4 | -9 | 11 | 0 | 1 | 7 | -10 | 9 | -1 | -2 | 12 | -11 | -3 | 15 | -27 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 6 | 2 | -7 | 4 | -8 | -5 | -7 | -6 | 7 | -9 | -5 | 6 | 1 | 12 | -11 | -2 | 144 | -258 |
| 1 | 0 | 7 | -2 | 6 | 4 | -8 | -4 | -64 | -49 | 7 | -9 | -4 | 55 | 9 | 12 | -11 | -1 | 1308 | -2455 |
| 1 | 0 | 8 | 1 | -2 | 4 | -8 | -3 | -555 | -424 | 7 | -9 | -3 | 484 | 79 | 12 | -11 | 0 | 11985 | -26276 |
| 1 | 1 | -12 | -0 | 1 | 4 | -8 | -2 | -5024 | -3841 | 7 | -9 | -2 | 4396 | 724 | 12 | -11 | 1 | 1076 | -4180 |
| 1 | 1 | -11 | -2 | 13 | 4 | -8 | -1 | -47821 | -36626 | 7 | -9 | -1 | 42156 | 6991 | 12 | -11 | 2 | 11656 | -25221 |
| 1 | 1 | -10 | -4 | -6 | 4 | -8 | 0 | -509051 | -390575 | 7 | -9 | 0 | 459046 | 76869 | 12 | -11 | 3 | 1261 | -3718 |
| 1 | 1 | -9 | -10 | 44 | 4 | -8 | 1 | 66423 | -22151 | 7 | -9 | 1 | 116164 | -2171 | 12 | -11 | 4 | 138 | -436 |
| 1 | 1 | -8 | -32 | 40 | 4 | -8 | 2 | -524566 | -397906 | 7 | -9 | 2 | 437521 | 75490 | 12 | -11 | 5 | 15 | -51 |
| 1 | 1 | -7 | -6 | 7 | 4 | -8 | 3 | -24519 | -45120 | 7 | -9 | 3 | 79291 | 6280 | 12 | -11 | 6 | 2 | -6 |
| 1 | 1 | -6 | -57 | 47 | 4 | -8 | 4 | -1747 | -4521 | 7 | -9 | 4 | 9651 | 741 | 12 | -10 | -2 | 5 | 8 |
| 1 | 1 | -5 | -77 | 570 | 4 | -8 | 5 | 31 | -566 | 7 | -9 | 5 | 1124 | 118 | 12 | -10 | -1 | 32 | 93 |
| 1 | 1 | -4 | -707 | 4351 | 4 | -8 | 6 | 50 | -65 | 7 | -9 | 6 | 142 | -17 | 12 | -10 | 0 | 320 | 305 |
| 1 | 1 | -3 | -4805 | 29471 | 4 | -8 | 7 | 9 | 3 | 7 | -9 | 7 | 55 | 28 | 12 | -10 | 1 | 263 | 247 |
| 1 | 1 | -2 | -9532 | 54321 | 4 | -8 | 8 | 41 | 42 | 7 | -9 | 8 | -5 | 1 | 12 | -10 | 2 | 236 | 256 |
| 1 | 1 | -1 | -20876 | 107429 | 4 | -8 | 9 | 4 | 3 | 7 | -8 | -4 | -1 | 1 | 12 | -10 | 3 | 104 | 57 |
| 1 | 1 | 0 | -29338 | 151205 | 4 | -8 | 10 | 5 | 3 | 7 | -8 | -3 | -7 | 15 | 12 | -10 | 4 | 8 | 4 |
| 1 | 1 | 1 | -6821 | 12493 | 4 | -8 | 11 | 1 | 1 | 7 | -8 | -2 | -62 | 141 | 12 | -9 | -3 | -0 | -3 |
| 1 | 1 | 2 | -754 | 1206 | 4 | -7 | -4 | -4 | -4 | 7 | -8 | -1 | -642 | 1475 | 12 | -9 | -2 | -2 | 1 |
| 1 | 1 | 3 | -98 | 101 | 4 | -7 | -3 | -36 | -38 | 7 | -8 | 0 | -7320 | 19588 | 12 | -9 | -1 | -53 | -10 |
| 1 | 1 | 4 | 5 | 43 | 4 | -7 | -2 | -352 | -383 | 7 | -8 | 1 | -3260 | 19288 | 12 | -9 | 0 | -107 | 45 |
| 1 | 1 | 5 | -10 | -26 | 4 | -7 | -1 | -3459 | -3766 | 7 | -8 | 2 | -5815 | 13357 | 12 | -9 | 1 | -156 | 39 |
| 1 | 1 | 6 | -23 | 3 | 4 | -7 | 0 | -40580 | -44127 | 7 | -8 | 3 | -1209 | 7143 | 12 | -9 | 2 | -80 | 11 |
| 1 | 1 | 7 | -4 | -8 | 4 | -7 | 1 | -50916 | -17026 | 7 | -8 | 4 | -150 | 856 | 12 | -9 | 3 | -34 | 22 |
| 1 | 1 | 8 | -4 | -1 | 4 | -7 | 2 | -28562 | -45650 | 7 | -8 | 5 | -18 | 107 | 12 | -9 | 4 | -3 | -5 |
| 1 | 1 | 9 | -4 | -3 | 4 | -7 | 3 | -14837 | -6894 | 7 | -8 | 6 | 62 | 11 | 12 | -9 | 5 | -0 | 1 |
| 1 | 2 | -13 | 3 | 6 | 4 | -7 | 4 | -1580 | -2419 | 7 | -8 | 7 | 21 | -3 | 12 | -8 | -3 | 4 | 0 |
| 1 | 2 | -12 | 12 | 14 | 4 | -7 | 5 | 41 | -272 | 7 | -8 | 8 | 7 | -3 | 12 | -8 | -2 | -3 | -1 |
| 1 | 2 | -11 | -5 | -3 | 4 | -7 | 6 | 55 | -35 | 7 | -7 | -3 | -9 | -21 | 12 | -8 | -1 | 13 | -29 |
| 1 | 2 | -10 | 48 | 70 | 4 | -7 | 7 | 24 | 12 | 7 | -7 | -2 | -66 | -182 | 12 | -8 | 0 | -45 | -77 |
| 1 | 2 | -9 | -18 | -22 | 4 | -7 | 8 | 49 | -0 | 7 | -7 | -1 | -667 | -1606 | 12 | -8 | 1 | -51 | -132 |
| 1 | 2 | -8 | 38 | 19 | 4 | -7 | 9 | 4 | 1 | 7 | -7 | 0 | -9267 | -10928 | 12 | -8 | 2 | -7 | -42 |
| 1 | 2 | -7 | -18 | 31 | 4 | -7 | 10 | 1 | 0 | 7 | -7 | 1 | -10420 | -8911 | 12 | -8 | 3 | -24 | -40 |
| 1 | 2 | -6 | 48 | 143 | 4 | -6 | -4 | -6 | -8 | 7 | -7 | 2 | -3886 | -7780 | 12 | -8 | 4 | 3 | -1 |
| 1 | 2 | -5 | 7 | 411 | 4 | -6 | -3 | -29 | -82 | 7 | -7 | 3 | -3144 | -2757 | 12 | -7 | -3 | -2 | 2 |
| 1 | 2 | -4 | 335 | 3951 | 4 | -6 | -2 | -282 | -767 | 7 | -7 | 4 | -272 | -499 | 12 | -7 | -2 | -2 | -0 |
| 1 | 2 | -3 | 1867 | 14567 | 4 | -6 | -1 | -2729 | -7906 | 7 | -7 | 5 | -23 | -60 | 12 | -7 | -1 | 16 | 28 |
| 1 | 2 | -2 | 16547 | 61021 | 4 | -6 | 0 | -34212 | -100307 | 7 | -7 | 6 | 29 | -54 | 12 | -7 | 0 | 42 | 43 |
| 1 | 2 | -1 | 11757 | 64520 | 4 | -6 | 1 | -80183 | -118490 | 7 | -7 | 7 | 4 | -2 | 12 | -7 | 1 | -37 | 42 |
| 1 | 2 | 0 | 24247 | 87040 | 4 | -6 | 2 | 808 | -65192 | 7 | -7 | 8 | 0 | -1 | 12 | -7 | 2 | 23 | 23 |
| 1 | 2 | 1 | 1844 | 6632 | 4 | -6 | 3 | -20382 | -38775 | 7 | -6 | -4 | 3 | -0 | 12 | -7 | 3 | -17 | 4 |
| 1 | 2 | 2 | 156 | 608 | 4 | -6 | 4 | -826 | -5895 | 7 | -6 | -3 | 41 | 2 | 12 | -7 | 4 | -2 | 0 |
| 1 | 2 | 3 | 18 | 76 | 4 | -6 | 5 | 234 | -930 | 7 | -6 | -2 | 297 | -31 | 12 | -6 | -3 | -1 | 0 |
| 1 | 2 | 4 | 11 | 26 | 4 | -6 | 6 | 77 | -122 | 7 | -6 | -1 | 2526 | -809 | 12 | -6 | -2 | -12 | 5 |
| 1 | 2 | 5 | -27 | -15 | 4 | -6 | 7 | 37 | -42 | 7 | -6 | 0 | 12869 | -15837 | 12 | -6 | -1 | -81 | 39 |
| 1 | 2 | 6 | 24 | 14 | 4 | -6 | 8 | 9 | -8 | 7 | -6 | 1 | 11116 | -15533 | 12 | -6 | 0 | 19 | -28 |
| 1 | 2 | 7 | -1 | 0 | 4 | -6 | 9 | 2 | -2 | 7 | -6 | 2 | 6880 | -9124 | 12 | -6 | 1 | -101 | 47 |
| 1 | 2 | 8 | 4 | -1 | 4 | -5 | -4 | 13 | -11 | 7 | -6 | 3 | 2687 | -4557 | 12 | -6 | 2 | 8 | -8 |
| 1 | 2 | 9 | 3 | 2 | 4 | -5 | -3 | 120 | -78 | 7 | -6 | 4 | 400 | -784 | 12 | -6 | 3 | 1 | -0 |
| 1 | 3 | -12 | -1 | -1 | 4 | -5 | -2 | 1170 | -731 | 7 | -6 | 5 | 69 | -136 | 12 | -5 | -3 | 7 | -11 |
| 1 | 3 | -11 | -4 | -10 | 4 | -5 | -1 | 12565 | -7999 | 7 | -6 | 6 | 3 | -26 | 12 | -5 | -2 | 33 | -53 |
| 1 | 3 | -10 | -11 | -11 | 4 | -5 | 0 | 177944 | -125872 | 7 | -6 | 7 | 3 | -11 | 12 | -5 | -1 | -15 | 80 |
| 1 | 3 | -9 | 7 | 10 | 4 | -5 | 1 | 148295 | -144976 | 7 | -5 | -5 | 1 | 2 | 12 | -5 | 0 | 111 | -178 |
| 1 | 3 | -8 | -37 | 33 | 4 | -5 | 2 | 99591 | -78056 | 7 | -5 | -4 | -8 | 7 | 12 | -5 | 1 | -9 | 65 |
| 1 | 3 | -7 | 51 | -26 | 4 | -5 | 3 | 45002 | -41114 | 7 | -5 | -3 | -18 | 29 | 12 | -5 | 2 | -1 | 11 |
| 1 | 3 | -6 | 19 | 8 | 4 | -5 | 4 | 7246 | -7833 | 7 | -5 | -2 | -393 | 354 | 12 | -4 | -5 | 1 | 4 |
| 1 | 3 | -5 | 322 | 369 | 4 | -5 | 5 | 967 | -1137 | 7 | -5 | -1 | -1958 | 2530 | 12 | -4 | -4 | 14 | 35 |
| 1 | 3 | -4 | 811 | 1273 | 4 | -5 | 6 | 128 | -146 | 7 | -5 | 0 | -5405 | 3742 | 12 | -4 | -3 | 38 | 173 |
| 1 | 3 | -3 | 3862 | 6661 | 4 | -5 | 7 | 21 | -42 | 7 | -5 | 1 | -7418 | -2575 | 12 | -4 | -2 | 172 | 661 |
| 1 | 3 | -2 | 7787 | 16019 | 4 | -5 | 8 | 2 | -7 | 7 | -5 | 2 | -2219 | 2184 | 12 | -4 | -1 | 142 | 518 |
| 1 | 3 | -1 | -1475 | 13641 | 4 | -4 | -5 | -8 | 6 | 7 | -5 | 3 | -1264 | -880 | 12 | -4 | 0 | 464 | 1764 |
| 1 | 3 | 0 | 4648 | 17427 | 4 | -4 | -4 | -46 | 14 | 7 | -5 | 4 | -202 | -179 | 12 | -4 | 1 | 58 | 132 |
| 1 | 3 | 1 | 368 | 1341 | 4 | -4 | -3 | -348 | 158 | 7 | -5 | 5 | -35 | -27 | 12 | -4 | 2 | 9 | 3 |
| 1 | 3 | 2 | 51 | 115 | 4 | -4 | -2 | -3026 | 1295 | 7 | -5 | 6 | -7 | -6 | 12 | -4 | 3 | 2 | -4 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 3 | 32 | -10 | 4 | -4 | -1 | -26862 | 12381 | 7 | -4 | -5 | -5 | -1 | 12 | -3 | -5 | -2 | 3 |
| 1 | 3 | 4 | -4 | -11 | 4 | -4 | 0 | -64290 | -5057 | 7 | -4 | -4 | -12 | -23 | 12 | -3 | -4 | 6 | 2 |
| 1 | 3 | 5 | -11 | -29 | 4 | -4 | 1 | -70451 | -81702 | 7 | -4 | -3 | -93 | -240 | 12 | -3 | -3 | 18 | 11 |
| 1 | 3 | 6 | 6 | -1 | 4 | -4 | 2 | -32153 | 4450 | 7 | -4 | -2 | -1157 | -1460 | 12 | -3 | -2 | 13 | -4 |
| 1 | 3 | 7 | -3 | -1 | 4 | -4 | 3 | -11514 | -19858 | 7 | -4 | -1 | -9247 | -8589 | 12 | -3 | -1 | 54 | 35 |
| 1 | 4 | -10 | 2 | -1 | 4 | -4 | 4 | -1756 | -3341 | 7 | -4 | 0 | 2490 | -1193 | 12 | -3 | 0 | 30 | 12 |
| 1 | 4 | -9 | 11 | -3 | 4 | -4 | 5 | -234 | -513 | 7 | -4 | 1 | -12095 | -10471 | 12 | -3 | 1 | 2 | -0 |
| 1 | 4 | -8 | -5 | -2 | 4 | -4 | 6 | -45 | -47 | 7 | -4 | 2 | 401 | -524 | 12 | -3 | 2 | -1 | 5 |
| 1 | 4 | -7 | 100 | -35 | 4 | -4 | 7 | -7 | -16 | 7 | -4 | 3 | -91 | -33 | 12 | -2 | -10 | 0 | -2 |
| 1 | 4 | -6 | 25 | 79 | 4 | -4 | 8 | -1 | -3 | 7 | -4 | 4 | -20 | -15 | 12 | -2 | -9 | -3 | -3 |
| 1 | 4 | -5 | 178 | 103 | 4 | -3 | -6 | -1 | -1 | 7 | -4 | 5 | -2 | 6 | 12 | -2 | -8 | 12 | 4 |
| 1 | 4 | -4 | 1245 | 257 | 4 | -3 | -5 | -5 | -21 | 7 | -4 | 6 | -3 | -0 | 12 | -2 | -7 | 5 | -15 |
| 1 | 4 | -3 | 1393 | 1410 | 4 | -3 | -4 | -81 | -207 | 7 | -3 | -6 | 1 | 6 | 12 | -2 | -6 | -6 | 1 |
| 1 | 4 | -2 | 1098 | 3769 | 4 | -3 | -3 | -586 | -1812 | 7 | -3 | -5 | 14 | 10 | 12 | -2 | -5 | 17 | 21 |
| 1 | 4 | -1 | -1491 | 1881 | 4 | -3 | -2 | -5449 | -14864 | 7 | -3 | -4 | 122 | 40 | 12 | -2 | -4 | -108 | -1 |
| 1 | 4 | 0 | 544 | 3473 | 4 | -3 | -1 | -52629 | -100224 | 7 | -3 | -3 | 975 | 110 | 12 | -2 | -3 | 43 | -123 |
| 1 | 4 | 1 | 13 | 277 | 4 | -3 | 0 | 63730 | 16589 | 7 | -3 | -2 | 6153 | 867 | 12 | -2 | -2 | -57 | 124 |
| 1 | 4 | 2 | 12 | 46 | 4 | -3 | 1 | -70202 | -128440 | 7 | -3 | -1 | -12420 | 2647 | 12 | -2 | -1 | -143 | -127 |
| 1 | 4 | 3 | -15 | -12 | 4 | -3 | 2 | 20705 | 3250 | 7 | -3 | 0 | 21584 | 2466 | 12 | -2 | 0 | -129 | -37 |
| 1 | 4 | 4 | 1 | 13 | 4 | -3 | 3 | 3077 | 1019 | 7 | -3 | 1 | -10904 | 2875 | 12 | -2 | 1 | -8 | -2 |
| 1 | 4 | 5 | -5 | -1 | 4 | -3 | 4 | 472 | 71 | 7 | -3 | 2 | -1373 | 448 | 12 | 20 | -6 | -2 | 7 |
| 1 | 4 | 6 | 1 | -4 | 4 | -3 | 5 | 59 | 10 | 7 | -3 | 3 | -134 | 69 | 12 | 20 | -5 | -24 | 74 |
| 1 | 5 | -10 | 2 | 1 | 4 | -3 | 6 | 8 | 0 | 7 | -3 | 4 | -26 | 1 | 12 | 20 | -3 | -27 | 81 |
| 1 | 5 | -9 | 33 | -15 | 4 | -3 | 7 | 1 | 1 | 7 | -3 | 5 | -1 | 4 | 12 | 20 | -2 | -2 | 7 |
| 1 | 5 | -8 | 14 | -23 | 4 | -3 | 8 | -0 | -3 | 7 | -3 | 6 | -7 | -2 | 12 | 21 | -6 | 3 | 10 |
| 1 | 5 | -7 | 18 | 15 | 4 | -2 | -8 | -0 | -1 | 7 | -2 | -8 | -7 | 5 | 12 | 21 | -5 | 34 | 102 |
| 1 | 5 | -6 | 20 | 5 | 4 | -2 | -7 | 7 | -4 | 7 | -2 | -7 | -49 | 25 | 12 | 21 | -3 | 29 | 89 |
| 1 | 5 | -5 | 268 | -168 | 4 | -2 | -6 | 28 | -4 | 7 | -2 | -6 | -288 | 137 | 12 | 21 | -2 | 3 | 10 |
| 1 | 5 | -4 | 475 | 31 | 4 | -2 | -5 | 268 | 26 | 7 | -2 | -5 | -2063 | 1339 | 12 | 22 | -5 | -0 | 2 |
| 1 | 5 | -3 | 232 | 280 | 4 | -2 | -4 | 1861 | 330 | 7 | -2 | -4 | -15653 | 10133 | 12 | 22 | -3 | -0 | 2 |
| 1 | 5 | -2 | 87 | 1144 | 4 | -2 | -3 | 15198 | 1779 | 7 | -2 | -3 | -104007 | 68265 | 13 | -20 | 1 | -2 | -2 |
| 1 | 5 | -1 | -444 | 91 | 4 | -2 | -2 | 124079 | 10768 | 7 | -2 | -2 | -385520 | 272256 | 13 | -20 | 3 | -2 | -2 |
| 1 | 5 | 0 | 32 | 1099 | 4 | -2 | -1 | 686180 | -69578 | 7 | -2 | -1 | -295481 | 203861 | 13 | -19 | 0 | -4 | -5 |
| 1 | 5 | 1 | 2 | 66 | 4 | -2 | 0 | 609420 | -210943 | 7 | -2 | 0 | -1050084 | 733002 | 13 | -19 | 1 | -29 | -43 |
| 1 | 5 | 2 | -3 | 15 | 4 | -2 | 1 | 712122 | -44037 | 7 | -2 | 1 | -70125 | 70356 | 13 | -19 | 3 | -39 | -57 |
| 1 | 5 | 3 | 3 | -3 | 4 | -2 | 2 | 213664 | -98821 | 7 | -2 | 2 | -5677 | 6549 | 13 | -19 | 4 | -4 | -5 |
| 1 | 6 | -11 | 2 | -3 | 4 | -2 | 3 | 27241 | -12778 | 7 | -2 | 3 | -562 | 689 | 13 | -18 | -2 | 6 | -3 |
| 1 | 6 | -9 | 3 | 9 | 4 | -2 | 4 | 3288 | -1536 | 7 | -2 | 4 | -60 | 76 | 13 | -18 | -1 | 52 | -29 |
| 1 | 6 | -8 | 4 | -78 | 4 | -2 | 5 | 411 | -219 | 7 | -2 | 5 | -7 | 9 | 13 | -18 | 0 | 483 | -273 |
| 1 | 6 | -7 | 9 | -6 | 4 | -2 | 6 | 27 | -12 | 7 | -1 | -8 | -1 | 1 | 13 | -18 | 1 | 5137 | -2900 |
| 1 | 6 | -6 | 23 | -102 | 4 | -2 | 7 | 5 | -10 | 7 | -1 | -7 | -15 | -11 | 13 | -18 | 2 | -2 | 18 |
| 1 | 6 | -5 | 98 | -77 | 4 | -2 | 8 | -10 | 12 | 7 | -1 | -6 | -16 | -47 | 13 | -18 | 3 | 5308 | -2996 |
| 1 | 6 | -4 | 149 | 34 | 4 | -2 | 9 | -0 | 1 | 7 | -1 | -5 | 29 | 29 | 13 | -18 | 4 | 489 | -270 |
| 1 | 6 | -3 | 247 | 648 | 4 | -1 | -8 | 0 | 1 | 7 | -1 | -4 | -76 | 179 | 13 | -18 | 5 | 52 | -29 |
| 1 | 6 | -2 | 221 | 6513 | 4 | -1 | -7 | 0 | 12 | 7 | -1 | -3 | 442 | 839 | 13 | -18 | 6 | 6 | -3 |
| 1 | 6 | -1 | 436 | 152 | 4 | -1 | -6 | -15 | 9 | 7 | -1 | -2 | -72 | 2866 | 13 | -17 | 0 | 2 | 6 |
| 1 | 6 | 0 | 278 | 6386 | 4 | -1 | -5 | -188 | -16 | 7 | -1 | -1 | 638 | 3188 | 13 | -17 | 1 | 22 | 76 |
| 1 | 6 | 1 | 26 | 607 | 4 | -1 | -4 | -1938 | -593 | 7 | -1 | 0 | 960 | 5144 | 13 | -17 | 3 | 18 | 64 |
| 1 | 6 | 2 | 5 | 59 | 4 | -1 | -3 | -14358 | -4653 | 7 | -1 | 1 | 58 | 376 | 13 | -17 | 4 | 2 | 6 |
| 1 | 6 | 3 | -1 | 6 | 4 | -1 | -2 | -62358 | -19540 | 7 | -1 | 2 | 0 | 30 | 13 | -16 | 0 | 0 | 4 |
| 1 | 6 | 4 | 1 | -1 | 4 | -1 | -1 | -36312 | -8232 | 7 | -1 | 3 | -1 | 6 | 13 | -16 | 1 | 3 | 56 |
| 1 | 7 | -12 | -0 | -2 | 4 | -1 | 0 | -177832 | -56859 | 7 | -1 | 4 | 4 | -1 | 13 | -16 | 3 | 2 | 40 |
| 1 | 7 | -11 | -1 | -6 | 4 | -1 | 1 | -15495 | -1097 | 7 | 0 | -7 | 4 | -4 | 13 | -16 | 4 | 0 | 4 |
| 1 | 7 | -10 | -5 | -29 | 4 | -1 | 2 | -1355 | -9 | 7 | 0 | -6 | 14 | -0 | 13 | -15 | -1 | 1 | 0 |
| 1 | 7 | -9 | -17 | -60 | 4 | -1 | 3 | -152 | 30 | 7 | 0 | -5 | 16 | 29 | 13 | -15 | 0 | 1 | 6 |
| 1 | 7 | -8 | -28 | -66 | 4 | -1 | 4 | -12 | -10 | 7 | 0 | -4 | 16 | 86 | 13 | -15 | 1 | -3 | 82 |
| 1 | 7 | -7 | 3 | -50 | 4 | -1 | 5 | -0 | -2 | 7 | 0 | -3 | -63 | 327 | 13 | -15 | 2 | 26 | 9 |
| 1 | 7 | -6 | -12 | -38 | 4 | -1 | 6 | 7 | -30 | 7 | 0 | -2 | 467 | 1211 | 13 | -15 | 3 | -4 | 51 |
| 1 | 7 | -5 | 30 | -25 | 4 | -1 | 7 | 0 | -2 | 7 | 0 | -1 | -552 | 1024 | 13 | -15 | 4 | 8 | 9 |
| 1 | 7 | -4 | 0 | 38 | 4 | -1 | 8 | 1 | -8 | 7 | 0 | 0 | -126 | 1427 | 13 | -15 | 5 | 1 | 0 |
| 1 | 7 | -3 | 5 | 12 | 4 | 0 | -8 | 5 | 2 | 7 | 0 | 1 | -13 | 96 | 13 | -14 | -1 | 1 | 0 |
| 1 | 7 | -2 | -3 | 5 | 4 | 0 | -7 | -0 | 12 | 7 | 0 | 2 | -2 | 10 | 13 | -14 | 0 | -8 | 3 |
| 1 | 7 | -1 | -1 | 2 | 4 | 0 | -6 | 50 | 66 | 7 | 0 | 3 | -1 | -5 | 13 | -14 | 1 | -244 | 49 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7 | 0 | -2 | -0 | 4 | 0 | -5 | -16 | 212 | 7 | 1 | -7 | 2 | 7 | 13 | -14 | 2 | 12 | 21 |
| 1 | 8 | -11 | 7 | 4 | 4 | 0 | -4 | -362 | 1712 | 7 | 1 | -6 | 47 | 16 | 13 | -14 | 3 | -111 | 19 |
| 1 | 8 | -10 | -12 | -19 | 4 | 0 | -3 | -1218 | 9630 | 7 | 1 | -5 | -30 | 18 | 13 | -14 | 4 | -18 | 9 |
| 1 | 8 | -9 | -4 | -32 | 4 | 0 | -2 | -4389 | 26802 | 7 | 1 | -4 | -2 | 36 | 13 | -13 | -2 | -0 | 1 |
| 1 | 8 | -8 | -3 | -27 | 4 | 0 | -1 | -5253 | 34945 | 7 | 1 | -3 | 74 | 32 | 13 | -13 | -1 | -2 | 7 |
| 1 | 8 | -7 | -4 | -14 | 4 | 0 | 0 | -8001 | 61789 | 7 | 1 | -2 | 4 | 283 | 13 | -13 | 0 | -17 | 41 |
| 1 | 8 | -6 | 22 | -4 | 4 | 0 | 1 | -507 | 4641 | 7 | 1 | -1 | -197 | 80 | 13 | -13 | 1 | -1 | -377 |
| 1 | 8 | -5 | 26 | 9 | 4 | 0 | 2 | -49 | 407 | 7 | 1 | 0 | -92 | 196 | 13 | -13 | 2 | -24 | 113 |
| 1 | 8 | -4 | 1 | 42 | 4 | 0 | 3 | -7 | 43 | 7 | 1 | 1 | -7 | 17 | 13 | -13 | 3 | -2 | -140 |
| 1 | 8 | -3 | 11 | 1 | 4 | 0 | 4 | -3 | 6 | 7 | 1 | 2 | -4 | -2 | 13 | -13 | 4 | 3 | -15 |
| 1 | 8 | -2 | 2 | 11 | 4 | 1 | -9 | -2 | -1 | 7 | 1 | 3 | 0 | -1 | 13 | -12 | -3 | -2 | -0 |
| 1 | 8 | -1 | 0 | 1 | 4 | 1 | -8 | -28 | -6 | 7 | 2 | -9 | 1 | -1 | 13 | -12 | -2 | -9 | -1 |
| 1 | 8 | 0 | -0 | 2 | 4 | 1 | -7 | 8 | 22 | 7 | 2 | -8 | 1 | -6 | 13 | -12 | -1 | -86 | -31 |
| 1 | 9 | -12 | 6 | 3 | 4 | 1 | -6 | 16 | -20 | 7 | 2 | -7 | 10 | -7 | 13 | -12 | 0 | -861 | -637 |
| 1 | 9 | -11 | 10 | 3 | 4 | 1 | -5 | 82 | 227 | 7 | 2 | -6 | 50 | -28 | 13 | -12 | 1 | 737 | 340 |
| 1 | 9 | -10 | 12 | 1 | 4 | 1 | -4 | 64 | 775 | 7 | 2 | -5 | 12 | 18 | 13 | -12 | 2 | -1024 | -720 |
| 1 | 9 | -9 | 6 | 12 | 4 | 1 | -3 | -1765 | 2308 | 7 | 2 | -4 | 27 | -20 | 13 | -12 | 3 | 164 | 14 |
| 1 | 9 | -8 | -5 | -29 | 4 | 1 | -2 | 462 | 9692 | 7 | 2 | -3 | 24 | 29 | 13 | -12 | 4 | 24 | 6 |
| 1 | 9 | -7 | -0 | 3 | 4 | 1 | -1 | -6597 | 5633 | 7 | 2 | -2 | -31 | 31 | 13 | -12 | 5 | 2 | 0 |
| 1 | 9 | -6 | -15 | 6 | 4 | 1 | 0 | -4946 | 9947 | 7 | 2 | -1 | -24 | -5 | 13 | -11 | -2 | 12 | -3 |
| 1 | 9 | -5 | -2 | -4 | 4 | 1 | 1 | -381 | 781 | 7 | 2 | 0 | -22 | 29 | 13 | -11 | -1 | 116 | -36 |
| 1 | 10 | -12 | 3 | -1 | 4 | 1 | 2 | 0 | 41 | 7 | 2 | 1 | 2 | 2 | 13 | -11 | 0 | 719 | -497 |
| 1 | 10 | -11 | 5 | 3 | 4 | 1 | 3 | -14 | 7 | 7 | 2 | 2 | 1 | 0 | 13 | -11 | 1 | 315 | -255 |
| 1 | 10 | -10 | 4 | 2 | 4 | 1 | 4 | 8 | -6 | 7 | 3 | -8 | -5 | 6 | 13 | -11 | 2 | 646 | -426 |
| 1 | 10 | -9 | 3 | 6 | 4 | 1 | 5 | 3 | -2 | 7 | 3 | -7 | 1 | -19 | 13 | -11 | 3 | 122 | -130 |
| 1 | 10 | -8 | 0 | 3 | 4 | 1 | 6 | 3 | 1 | 7 | 3 | -6 | 13 | 6 | 13 | -11 | 4 | 14 | -16 |
| 1 | 10 | -7 | -2 | 3 | 4 | 2 | -10 | -0 | 2 | 7 | 3 | -5 | -2 | -7 | 13 | -10 | -2 | -1 | 2 |
| 1 | 10 | -6 | -1 | 0 | 4 | 2 | -9 | 13 | -0 | 7 | 3 | -4 | 21 | -10 | 13 | -10 | -1 | -9 | 26 |
| 2 | -15 | 8 | 1 | -1 | 4 | 2 | -8 | 12 | 14 | 7 | 3 | -3 | 5 | 10 | 13 | -10 | 0 | 27 | 92 |
| 2 | -15 | 9 | 3 | 0 | 4 | 2 | -7 | 85 | 42 | 7 | 3 | -2 | -6 | 22 | 13 | -10 | 1 | 18 | 81 |
| 2 | -15 | 10 | 1 | 1 | 4 | 2 | -6 | 45 | 36 | 7 | 3 | -1 | -4 | -6 | 13 | -10 | 2 | 15 | 71 |
| 2 | -15 | 11 | -0 | 2 | 4 | 2 | -5 | 150 | 50 | 7 | 3 | 0 | -7 | 18 | 13 | -10 | 3 | 15 | 22 |
| 2 | -15 | 12 | 0 | 2 | 4 | 2 | -4 | 31 | 277 | 7 | 3 | 1 | -0 | 2 | 13 | -10 | 4 | 3 | 3 |
| 2 | -15 | 13 | -4 | 1 | 4 | 2 | -3 | 805 | 486 | 7 | 4 | -8 | -3 | 5 | 13 | -9 | -1 | -10 | -6 |
| 2 | -14 | 5 | -3 | -1 | 4 | 2 | -2 | -755 | 2083 | 7 | 4 | -7 | -3 | -4 | 13 | -9 | 0 | -24 | 1 |
| 2 | -14 | 7 | 3 | -0 | 4 | 2 | -1 | -1466 | -181 | 7 | 4 | -6 | -11 | -10 | 13 | -9 | 1 | -22 | -1 |
| 2 | -14 | 8 | -1 | 1 | 4 | 2 | 0 | -1099 | 1114 | 7 | 4 | -5 | 2 | -7 | 13 | -9 | 2 | -17 | 0 |
| 2 | -14 | 9 | 7 | 6 | 4 | 2 | 1 | -93 | 105 | 7 | 4 | -4 | -9 | -6 | 13 | -9 | 3 | -5 | 2 |
| 2 | -14 | 10 | 2 | 5 | 4 | 2 | 2 | -35 | 28 | 7 | 4 | -3 | 1 | -1 | 13 | -8 | -1 | 6 | -4 |
| 2 | -14 | 11 | -0 | 8 | 4 | 2 | 3 | -4 | 9 | 7 | 4 | -2 | -1 | 1 | 13 | -8 | 0 | 2 | 15 |
| 2 | -14 | 12 | -7 | 9 | 4 | 2 | 4 | -5 | 6 | 7 | 4 | 0 | -1 | 1 | 13 | -8 | 1 | 7 | 19 |
| 2 | -14 | 13 | -7 | 0 | 4 | 2 | 5 | -6 | 3 | 7 | 5 | -9 | 2 | 1 | 13 | -8 | 2 | 1 | 6 |
| 2 | -13 | 4 | -0 | 4 | 4 | 2 | 6 | -3 | 1 | 7 | 5 | -8 | -4 | 5 | 13 | -8 | 3 | 0 | 7 |
| 2 | -13 | 5 | -6 | 8 | 4 | 3 | -10 | 2 | -0 | 7 | 5 | -6 | 4 | 3 | 13 | -7 | -1 | 2 | 6 |
| 2 | -13 | 6 | -7 | -9 | 4 | 3 | -9 | 6 | 3 | 7 | 5 | -5 | -2 | -0 | 13 | -7 | 0 | -1 | -5 |
| 2 | -13 | 7 | -7 | 18 | 4 | 3 | -8 | 37 | 13 | 7 | 5 | -4 | -0 | -2 | 13 | -7 | 1 | 2 | 6 |
| 2 | -13 | 8 | -33 | -20 | 4 | 3 | -7 | 1 | 26 | 8 | -16 | 0 | 1 | 1 | 13 | -7 | 2 | -1 | -5 |
| 2 | -13 | 9 | 20 | -10 | 4 | 3 | -6 | 34 | 0 | 8 | -16 | 1 | 8 | 15 | 13 | -6 | -2 | 2 | 0 |
| 2 | -13 | 10 | 26 | -27 | 4 | 3 | -5 | 62 | 30 | 8 | -16 | 3 | 8 | 15 | 13 | -6 | -1 | 24 | 5 |
| 2 | -13 | 11 | -8 | -25 | 4 | 3 | -4 | 345 | -59 | 8 | -16 | 4 | 1 | 1 | 13 | -6 | 1 | 24 | 5 |
| 2 | -13 | 12 | -2 | 8 | 4 | 3 | -3 | 150 | 289 | 8 | -15 | 1 | -4 | -0 | 13 | -6 | 2 | 2 | 0 |
| 2 | -13 | 13 | -10 | 6 | 4 | 3 | -2 | -323 | 265 | 8 | -15 | 3 | -4 | -0 | 13 | -5 | -3 | -0 | 1 |
| 2 | -12 | 2 | 2 | -3 | 4 | 3 | -1 | -176 | -165 | 8 | -14 | 2 | 4 | 2 | 13 | -5 | -2 | 5 | -7 |
| 2 | -12 | 3 | -3 | -0 | 4 | 3 | 0 | -204 | 163 | 8 | -14 | 3 | 2 | 5 | 13 | -5 | -1 | -2 | -0 |
| 2 | -12 | 4 | 9 | -10 | 4 | 3 | 1 | -23 | 28 | 8 | -14 | 4 | -2 | 0 | 13 | -5 | 0 | 13 | -17 |
| 2 | -12 | 5 | -20 | 2 | 4 | 3 | 2 | -21 | -1 | 8 | -14 | 6 | -4 | -0 | 13 | -5 | 1 | -3 | 1 |
| 2 | -12 | 6 | -3 | 19 | 4 | 3 | 3 | 0 | 1 | 8 | -14 | 7 | -1 | -2 | 13 | -5 | 2 | -0 | 1 |
| 2 | -12 | 7 | -46 | 13 | 4 | 3 | 4 | -4 | -1 | 8 | -13 | 0 | -6 | -6 | 13 | -4 | -5 | 1 | -1 |
| 2 | -12 | 8 | -26 | -24 | 4 | 3 | 5 | -2 | 0 | 8 | -13 | 1 | 7 | 8 | 13 | -4 | -4 | 23 | -13 |
| 2 | -12 | 9 | -21 | -30 | 4 | 4 | -9 | -5 | 2 | 8 | -13 | 2 | -12 | -24 | 13 | -4 | -3 | 9 | 88 |
| 2 | -12 | 10 | -32 | -19 | 4 | 4 | -8 | 55 | -40 | 8 | -13 | 3 | -24 | 20 | 13 | -4 | -2 | 56 | 116 |
| 2 | -12 | 11 | 15 | -42 | 4 | 4 | -7 | 26 | 29 | 8 | -13 | 4 | 4 | -7 | 13 | -4 | -1 | 2 | 213 |
| 2 | -12 | 12 | 3 | -9 | 4 | 4 | -6 | 20 | -10 | 8 | -13 | 5 | -1 | 3 | 13 | -4 | 0 | 41 | 434 |

# Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -12 | 13 | -2 | 2 | 4 | 4 | -5 | 46 | -48 | 8 | -13 | 6 | -2 | -5 | 13 | -4 | 1 | 5 | 36 |
| 2 | -11 | 2 | -2 | 1 | 4 | 4 | -4 | 60 | 33 | 8 | -13 | 7 | 7 | -1 | 13 | -4 | 2 | -2 | -0 |
| 2 | -11 | 3 | 9 | -2 | 4 | 4 | -3 | -13 | 51 | 8 | -12 | 0 | 8 | -0 | 13 | -4 | 3 | 2 | -3 |
| 2 | -11 | 4 | 12 | 12 | 4 | 4 | -2 | -100 | 58 | 8 | -12 | 1 | 34 | 130 | 13 | -3 | -4 | -1 | -0 |
| 2 | -11 | 5 | 44 | 20 | 4 | 4 | -1 | 16 | -41 | 8 | -12 | 2 | 79 | -132 | 13 | -3 | -3 | 1 | -0 |
| 2 | -11 | 6 | -14 | 71 | 4 | 4 | 0 | -67 | 23 | 8 | -12 | 3 | 61 | 63 | 13 | -3 | -2 | -1 | -0 |
| 2 | -11 | 7 | -51 | 11 | 4 | 4 | 1 | -1 | 4 | 8 | -12 | 4 | 8 | -23 | 13 | -3 | -1 | -1 | -4 |
| 2 | -11 | 8 | -17 | -46 | 4 | 4 | 2 | -0 | -5 | 8 | -12 | 5 | 35 | -9 | 13 | -2 | -9 | 1 | 3 |
| 2 | -11 | 9 | -11 | -15 | 4 | 5 | -11 | -0 | -1 | 8 | -12 | 6 | -7 | 9 | 13 | -2 | -7 | 7 | 34 |
| 2 | -11 | 10 | -35 | -29 | 4 | 5 | -9 | -7 | -8 | 8 | -12 | 7 | 2 | -4 | 13 | -2 | -6 | -3 | -21 |
| 2 | -11 | 11 | -14 | -83 | 4 | 5 | -8 | 14 | -17 | 8 | -11 | -2 | 1 | -4 | 13 | -2 | -5 | 29 | 16 |
| 2 | -11 | 12 | -0 | 5 | 4 | 5 | -7 | 16 | -21 | 8 | -11 | -1 | 8 | -24 | 13 | -2 | -4 | -39 | 36 |
| 2 | -11 | 13 | -1 | -5 | 4 | 5 | -6 | 18 | -7 | 8 | -11 | 0 | 85 | -164 | 13 | -2 | -3 | 39 | -30 |
| 2 | -10 | 1 | 1 | -2 | 4 | 5 | -5 | 32 | -9 | 8 | -11 | 1 | 98 | 1370 | 13 | -2 | -2 | -17 | 27 |
| 2 | -10 | 2 | -9 | -10 | 4 | 5 | -4 | -4 | 35 | 8 | -11 | 2 | 369 | -546 | 13 | -2 | -1 | -13 | -25 |
| 2 | -10 | 3 | 12 | -29 | 4 | 5 | -3 | -5 | 15 | 8 | -11 | 3 | 16 | 611 | 13 | -2 | 0 | -14 | -9 |
| 2 | -10 | 4 | 84 | 8 | 4 | 5 | -2 | -28 | 26 | 8 | -11 | 4 | 87 | -16 | 13 | -2 | 2 | 1 | 3 |
| 2 | -10 | 5 | 2 | 169 | 4 | 5 | -1 | -7 | 5 | 8 | -11 | 5 | 2 | 55 | 13 | 0 | -2 | -1 | -0 |
| 2 | -10 | 6 | -233 | 87 | 4 | 5 | 0 | -18 | 21 | 8 | -11 | 6 | -15 | -0 | 13 | 0 | 0 | -1 | -0 |
| 2 | -10 | 7 | -117 | -104 | 4 | 5 | 1 | -3 | 3 | 8 | -11 | 7 | -6 | 5 | 13 | 19 | -5 | -4 | -1 |
| 2 | -10 | 8 | -33 | -6 | 4 | 6 | -10 | 5 | 5 | 8 | -11 | 8 | -4 | 2 | 13 | 19 | -3 | -1 | -1 |
| 2 | -10 | 9 | -33 | -10 | 4 | 6 | -9 | -12 | -13 | 8 | -10 | -4 | 1 | -1 | 13 | 19 | -1 | 3 | -0 |
| 2 | -10 | 10 | -53 | -60 | 4 | 6 | -8 | 29 | -29 | 8 | -10 | -3 | 5 | -11 | 13 | 20 | -10 | -4 | 4 |
| 2 | -10 | 11 | -42 | -48 | 4 | 6 | -7 | -11 | 20 | 8 | -10 | -2 | 49 | -101 | 13 | 20 | -9 | -32 | 34 |
| 2 | -10 | 12 | -8 | -10 | 4 | 6 | -6 | 8 | -14 | 8 | -10 | -1 | 456 | -937 | 13 | 20 | -8 | -281 | 300 |
| 2 | -10 | 13 | -3 | -3 | 4 | 6 | -5 | 21 | 7 | 8 | -10 | 0 | 4530 | -9478 | 13 | 20 | -7 | -2541 | 2717 |
| 2 | -9 | -2 | 3 | -1 | 4 | 6 | -4 | 6 | -0 | 8 | -10 | 1 | -3280 | 14432 | 13 | 20 | -6 | -24272 | 25954 |
| 2 | -9 | -1 | 2 | -2 | 4 | 6 | -3 | 4 | 7 | 8 | -10 | 2 | 5494 | -11364 | 13 | 20 | -5 | -260691 | 278861 |
| 2 | -9 | 0 | 34 | -17 | 4 | 6 | -2 | 7 | 1 | 8 | -10 | 3 | -740 | 4022 | 13 | 20 | -4 | 1235 | -1214 |
| 2 | -9 | 1 | 60 | -33 | 4 | 6 | -1 | 3 | -1 | 8 | -10 | 4 | -58 | 657 | 13 | 20 | -3 | -260350 | 278483 |
| 2 | -9 | 2 | -11 | -139 | 4 | 6 | 0 | 4 | 2 | 8 | -10 | 5 | -16 | 64 | 13 | 20 | -2 | -23825 | 25530 |
| 2 | -9 | 3 | 282 | -124 | 4 | 7 | -11 | 2 | 0 | 8 | -10 | 6 | 10 | -4 | 13 | 20 | -1 | -2481 | 2660 |
| 2 | -9 | 4 | 372 | 450 | 4 | 7 | -10 | 2 | 3 | 8 | -10 | 7 | -1 | -5 | 13 | 20 | 0 | -273 | 293 |
| 2 | -9 | 5 | -478 | 723 | 4 | 7 | -9 | -3 | 0 | 8 | -10 | 8 | -1 | 0 | 13 | 20 | 1 | -32 | 34 |
| 2 | -9 | 6 | -589 | -83 | 4 | 7 | -8 | -10 | -2 | 8 | -9 | -4 | 4 | 2 | 13 | 20 | 2 | -4 | 4 |
| 2 | -9 | 7 | -132 | -11 | 4 | 7 | -7 | -4 | -8 | 8 | -9 | -3 | 27 | 16 | 13 | 21 | -6 | -1 | 8 |
| 2 | -9 | 8 | -29 | 0 | 4 | 7 | -6 | 1 | -8 | 8 | -9 | -2 | 248 | 151 | 13 | 21 | -5 | -13 | 81 |
| 2 | -9 | 9 | -27 | -23 | 4 | 7 | -5 | -3 | -4 | 8 | -9 | -1 | 2421 | 1489 | 13 | 21 | -3 | -10 | 63 |
| 2 | -9 | 10 | -9 | 2 | 4 | 7 | -4 | 3 | -2 | 8 | -9 | 0 | 28776 | 17266 | 13 | 21 | -2 | -1 | 8 |
| 2 | -9 | 11 | -11 | -3 | 4 | 8 | -11 | 2 | -1 | 8 | -9 | 1 | 19278 | 6652 | 13 | 22 | -5 | -2 | 3 |
| 2 | -9 | 12 | -4 | -0 | 4 | 8 | -10 | 2 | 2 | 8 | -9 | 2 | 24026 | 15061 | 13 | 22 | -3 | -2 | 3 |
| 2 | -8 | -3 | -1 | 1 | 4 | 8 | -8 | 1 | 1 | 8 | -9 | 3 | 8436 | 3480 | 14 | -20 | 1 | -5 | -4 |
| 2 | -8 | -2 | 16 | -9 | 4 | 8 | -7 | -2 | 2 | 8 | -9 | 4 | 1080 | 450 | 14 | -20 | 2 | 1 | -3 |
| 2 | -8 | -1 | 103 | -53 | 4 | 8 | -6 | -1 | -1 | 8 | -9 | 5 | 118 | 22 | 14 | -20 | 3 | -7 | -6 |
| 2 | -8 | 0 | 1187 | -593 | 4 | 11 | -3 | 0 | 1 | 8 | -9 | 6 | 11 | -22 | 14 | -20 | 4 | 0 | -1 |
| 2 | -8 | 1 | 1522 | 534 | 4 | 11 | -1 | 0 | 1 | 8 | -9 | 7 | 1 | 5 | 14 | -19 | -1 | -0 | -3 |
| 2 | -8 | 2 | 1787 | -1862 | 5 | -16 | 9 | -4 | -1 | 8 | -8 | -3 | -13 | 0 | 14 | -19 | 0 | -2 | -24 |
| 2 | -8 | 3 | 2802 | 671 | 5 | -16 | 10 | 1 | -3 | 8 | -8 | -2 | -96 | 24 | 14 | -19 | 1 | -25 | -237 |
| 2 | -8 | 4 | 348 | 3134 | 5 | -16 | 11 | -0 | 2 | 8 | -8 | -1 | -815 | 301 | 14 | -19 | 2 | 41 | 28 |
| 2 | -8 | 5 | -2040 | 1159 | 5 | -16 | 12 | 0 | 1 | 8 | -8 | 0 | -6257 | 5215 | 14 | -19 | 3 | -33 | -284 |
| 2 | -8 | 6 | -428 | 369 | 5 | -16 | 13 | 3 | 3 | 8 | -8 | 1 | -4402 | 5264 | 14 | -19 | 4 | 10 | -15 |
| 2 | -8 | 7 | -143 | 95 | 5 | -16 | 14 | -1 | 4 | 8 | -8 | 2 | -4569 | 3283 | 14 | -19 | 5 | -0 | -3 |
| 2 | -8 | 8 | -38 | 51 | 5 | -15 | -12 | -16 | 1 | 8 | -8 | 3 | -1545 | 1797 | 14 | -18 | -2 | 5 | -0 |
| 2 | -8 | 9 | -11 | 14 | 5 | -15 | -11 | 4 | -18 | 8 | -8 | 4 | -256 | 296 | 14 | -18 | -1 | 46 | -1 |
| 2 | -8 | 10 | -70 | 35 | 5 | -15 | -10 | 41 | -3 | 8 | -8 | 5 | -92 | -39 | 14 | -18 | 0 | 446 | -14 |
| 2 | -8 | 11 | -2 | 2 | 5 | -15 | -9 | -1 | 26 | 8 | -8 | 6 | -23 | -5 | 14 | -18 | 1 | 4874 | -150 |
| 2 | -8 | 12 | -2 | 1 | 5 | -15 | -8 | -27 | 3 | 8 | -8 | 7 | -5 | -4 | 14 | -18 | 2 | -9 | -42 |
| 2 | -7 | -6 | 2 | -1 | 5 | -15 | -7 | -4 | -2 | 8 | -7 | -4 | 1 | -1 | 14 | -18 | 3 | 4628 | -140 |
| 2 | -7 | -5 | 15 | -7 | 5 | -15 | 7 | -0 | 2 | 8 | -7 | -3 | 2 | -9 | 14 | -18 | 4 | 435 | -27 |
| 2 | -7 | -4 | 130 | -65 | 5 | -15 | 8 | -13 | -3 | 8 | -7 | -2 | 20 | -101 | 14 | -18 | 5 | 46 | -1 |
| 2 | -7 | -3 | 1147 | -569 | 5 | -15 | 9 | -2 | -16 | 8 | -7 | -1 | 58 | -839 | 14 | -18 | 6 | 5 | -0 |
| 2 | -7 | -2 | 10414 | -5170 | 5 | -15 | 10 | -26 | -11 | 8 | -7 | 0 | -2693 | -3404 | 14 | -17 | 0 | 5 | 2 |
| 2 | -7 | -1 | 99775 | -49579 | 5 | -15 | 11 | 4 | -62 | 8 | -7 | 1 | -2294 | -2595 | 14 | -17 | 1 | 62 | 31 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -7 | 0 | 1082213 | -539138 | 5 | -15 | 12 | 5 | -3 | 8 | -7 | 2 | -1936 | -2211 | 14 | -17 | 3 | 49 | 24 |
| 2 | -7 | 1 | -61962 | -127977 | 5 | -15 | 13 | 13 | 7 | 8 | -7 | 3 | -858 | -631 | 14 | -17 | 4 | 5 | 2 |
| 2 | -7 | 2 | 1070117 | -521200 | 5 | -15 | 14 | -3 | 7 | 8 | -7 | 4 | -200 | -125 | 14 | -16 | 0 | 3 | 2 |
| 2 | -7 | 3 | 88018 | -80410 | 5 | -14 | 0 | -1 | -3 | 8 | -7 | 5 | -57 | -22 | 14 | -16 | 1 | 51 | 22 |
| 2 | -7 | 4 | 4051 | -2418 | 5 | -14 | 4 | 1 | 4 | 8 | -7 | 6 | -6 | -3 | 14 | -16 | 3 | 35 | 14 |
| 2 | -7 | 5 | 796 | 814 | 5 | -14 | 5 | 13 | -7 | 8 | -6 | -3 | 15 | -3 | 14 | -16 | 4 | 3 | 2 |
| 2 | -7 | 6 | -68 | 630 | 5 | -14 | 6 | 4 | 31 | 8 | -6 | -2 | 70 | 129 | 14 | -15 | 0 | -1 | 7 |
| 2 | -7 | 7 | -46 | 213 | 5 | -14 | 7 | 36 | -16 | 8 | -6 | -1 | 511 | 636 | 14 | -15 | 1 | -9 | 131 |
| 2 | -7 | 8 | -41 | 51 | 5 | -14 | 8 | 28 | 55 | 8 | -6 | 0 | -1914 | 1943 | 14 | -15 | 2 | -2 | -11 |
| 2 | -7 | 9 | -2 | 26 | 5 | -14 | 9 | -52 | 44 | 8 | -6 | 1 | -2458 | 2635 | 14 | -15 | 3 | -5 | 68 |
| 2 | -7 | 10 | -3 | 8 | 5 | -14 | 10 | -62 | -24 | 8 | -6 | 2 | -779 | 844 | 14 | -15 | 4 | -4 | 4 |
| 2 | -7 | 11 | -1 | 3 | 5 | -14 | 11 | 22 | -35 | 8 | -6 | 3 | -813 | 491 | 14 | -14 | -1 | 1 | 1 |
| 2 | -6 | -5 | 4 | -3 | 5 | -14 | 12 | 5 | 11 | 8 | -6 | 4 | -177 | 88 | 14 | -14 | 0 | -0 | 2 |
| 2 | -6 | -4 | 17 | -7 | 5 | -14 | 13 | 4 | -1 | 8 | -6 | 5 | -23 | 14 | 14 | -14 | 1 | -167 | -29 |
| 2 | -6 | -3 | 155 | -67 | 5 | -14 | 14 | -1 | 8 | 8 | -6 | 6 | -3 | 1 | 14 | -14 | 2 | 26 | 10 |
| 2 | -6 | -2 | 1452 | -539 | 5 | -13 | 2 | 1 | 1 | 8 | -5 | -4 | 5 | -4 | 14 | -14 | 3 | -70 | -11 |
| 2 | -6 | -1 | 14454 | -5188 | 5 | -13 | 3 | 7 | -0 | 8 | -5 | -3 | -10 | 3 | 14 | -14 | 4 | -8 | -3 |
| 2 | -6 | 0 | 171064 | -61406 | 5 | -13 | 4 | 10 | -10 | 8 | -5 | -2 | -208 | 61 | 14 | -13 | -1 | -10 | 6 |
| 2 | -6 | 1 | 44818 | -138510 | 5 | -13 | 5 | -1 | -8 | 8 | -5 | -1 | -723 | 632 | 14 | -13 | 0 | -57 | 49 |
| 2 | -6 | 2 | 196016 | -28864 | 5 | -13 | 6 | 9 | -11 | 8 | -5 | 0 | 453 | -2632 | 14 | -13 | 1 | 72 | -190 |
| 2 | -6 | 3 | 32495 | 3272 | 5 | -13 | 7 | 38 | -22 | 8 | -5 | 1 | -1177 | 768 | 14 | -13 | 2 | -85 | 83 |
| 2 | -6 | 4 | 11766 | 896 | 5 | -13 | 8 | 7 | 40 | 8 | -5 | 2 | 360 | -1054 | 14 | -13 | 3 | 21 | -63 |
| 2 | -6 | 5 | 2610 | 3593 | 5 | -13 | 9 | 7 | 3 | 8 | -5 | 3 | 10 | -266 | 14 | -13 | 4 | 4 | -10 |
| 2 | -6 | 6 | 422 | 1076 | 5 | -13 | 10 | 33 | 24 | 8 | -5 | 4 | 9 | -31 | 14 | -12 | -4 | -2 | -4 |
| 2 | -6 | 7 | 35 | 261 | 5 | -13 | 11 | -18 | 18 | 8 | -5 | 5 | -7 | -5 | 14 | -12 | -3 | -17 | -34 |
| 2 | -6 | 8 | 2 | 37 | 5 | -13 | 12 | -28 | -36 | 8 | -4 | -5 | -2 | -0 | 14 | -12 | -2 | -150 | -309 |
| 2 | -6 | 9 | 10 | 66 | 5 | -13 | 13 | -2 | -18 | 8 | -4 | -4 | 13 | 4 | 14 | -12 | -1 | -1402 | -2994 |
| 2 | -6 | 10 | 1 | 3 | 5 | -13 | 14 | -1 | -1 | 8 | -4 | -3 | 14 | 24 | 14 | -12 | 0 | -14298 | -33490 |
| 2 | -6 | 11 | 0 | 2 | 5 | -12 | 2 | 3 | 2 | 8 | -4 | -2 | 172 | 255 | 14 | -12 | 1 | 1214 | 1930 |
| 2 | -5 | -5 | 5 | 1 | 5 | -12 | 3 | -3 | 3 | 8 | -4 | -1 | 869 | 4159 | 14 | -12 | 2 | -14594 | -33977 |
| 2 | -5 | -4 | 55 | -1 | 5 | -12 | 4 | -12 | -0 | 8 | -4 | 0 | -1290 | -590 | 14 | -12 | 3 | -882 | -2649 |
| 2 | -5 | -3 | 509 | -44 | 5 | -12 | 5 | -15 | -30 | 8 | -4 | 1 | 784 | 4584 | 14 | -12 | 4 | -77 | -260 |
| 2 | -5 | -2 | 4762 | -534 | 5 | -12 | 6 | 49 | -32 | 8 | -4 | 2 | -501 | 381 | 14 | -12 | 5 | -8 | -28 |
| 2 | -5 | -1 | 49164 | -5079 | 5 | -12 | 7 | 35 | 50 | 8 | -4 | 3 | -99 | 33 | 14 | -12 | 6 | -2 | -4 |
| 2 | -5 | 0 | 622982 | -64961 | 5 | -12 | 8 | -37 | 59 | 8 | -4 | 4 | -41 | -6 | 14 | -11 | -2 | 1 | 1 |
| 2 | -5 | 1 | 566045 | -333009 | 5 | -12 | 9 | -21 | -1 | 8 | -4 | 5 | -3 | -0 | 14 | -11 | -1 | 25 | 7 |
| 2 | -5 | 2 | 565566 | 158030 | 5 | -12 | 10 | 19 | 13 | 8 | -3 | -5 | 6 | -3 | 14 | -11 | 0 | 114 | -8 |
| 2 | -5 | 3 | 193319 | -71175 | 5 | -12 | 11 | 0 | 27 | 8 | -3 | -4 | 23 | 14 | 14 | -11 | 1 | 77 | -11 |
| 2 | -5 | 4 | 50131 | 9954 | 5 | -12 | 12 | -47 | -10 | 8 | -3 | -3 | 154 | 69 | 14 | -11 | 2 | 96 | -4 |
| 2 | -5 | 5 | 8798 | 3964 | 5 | -12 | 13 | 4 | 1 | 8 | -3 | -2 | 906 | 682 | 14 | -11 | 3 | 23 | -10 |
| 2 | -5 | 6 | 1311 | 774 | 5 | -12 | 14 | -8 | -3 | 8 | -3 | -1 | -593 | -539 | 14 | -11 | 4 | 2 | -1 |
| 2 | -5 | 7 | 176 | 128 | 5 | -12 | 15 | -2 | -1 | 8 | -3 | 0 | 2729 | 2006 | 14 | -10 | -1 | -4 | 4 |
| 2 | -5 | 8 | 19 | 1 | 5 | -11 | 0 | -2 | 2 | 8 | -3 | 1 | -372 | -316 | 14 | -10 | 0 | -9 | 15 |
| 2 | -5 | 9 | 9 | 20 | 5 | -11 | 1 | -5 | 4 | 8 | -3 | 2 | -50 | -57 | 14 | -10 | 1 | -4 | 4 |
| 2 | -5 | 10 | 2 | 3 | 5 | -11 | 2 | 3 | 25 | 8 | -3 | 3 | 8 | -17 | 14 | -10 | 2 | -6 | 11 |
| 2 | -5 | 11 | 1 | 1 | 5 | -11 | 3 | -37 | 26 | 8 | -3 | 4 | 3 | 2 | 14 | -9 | -1 | 0 | -2 |
| 2 | -4 | -8 | 1 | 2 | 5 | -11 | 4 | -89 | -35 | 8 | -3 | 5 | 3 | -1 | 14 | -9 | 1 | 0 | -2 |
| 2 | -4 | -7 | -3 | -8 | 5 | -11 | 5 | 51 | -174 | 8 | -2 | -9 | 3 | 0 | 14 | -8 | -1 | 2 | 0 |
| 2 | -4 | -6 | 1 | -12 | 5 | -11 | 6 | 253 | 26 | 8 | -2 | -7 | 20 | 6 | 14 | -8 | 1 | 2 | 0 |
| 2 | -4 | -5 | 19 | 13 | 5 | -11 | 7 | 15 | 265 | 8 | -2 | -6 | -3 | 94 | 14 | -7 | -1 | -1 | 6 |
| 2 | -4 | -4 | 198 | 36 | 5 | -11 | 8 | -128 | 34 | 8 | -2 | -5 | -202 | 598 | 14 | -7 | 1 | -1 | 6 |
| 2 | -4 | -3 | 1659 | 321 | 5 | -11 | 9 | 15 | 11 | 8 | -2 | -4 | -3346 | 3701 | 14 | -6 | -2 | 2 | 5 |
| 2 | -4 | -2 | 15716 | 3252 | 5 | -11 | 10 | -5 | 8 | 8 | -2 | -3 | -36446 | 14654 | 14 | -6 | -1 | -2 | -1 |
| 2 | -4 | -1 | 167679 | 35795 | 5 | -11 | 11 | 32 | 19 | 8 | -2 | -2 | -80475 | 66659 | 14 | -6 | 1 | -1 | 2 |
| 2 | -4 | 0 | 2257200 | 501258 | 5 | -11 | 12 | -40 | 14 | 8 | -2 | -1 | -129635 | 44980 | 14 | -6 | 2 | -2 | -5 |
| 2 | -4 | 1 | 2497694 | 319389 | 5 | -11 | 13 | -1 | 1 | 8 | -2 | 0 | -272797 | 130255 | 14 | -5 | -3 | -2 | 0 |
| 2 | -4 | 2 | 1217069 | 297244 | 5 | -11 | 14 | -1 | 1 | 8 | -2 | 1 | -20146 | 11463 | 14 | -5 | -1 | -2 | 0 |
| 2 | -4 | 3 | 689007 | 102495 | 5 | -10 | -1 | -5 | 6 | 8 | -2 | 2 | -1750 | 1072 | 14 | -4 | -5 | 8 | 4 |
| 2 | -4 | 4 | 114976 | 18871 | 5 | -10 | 0 | -50 | 29 | 8 | -2 | 3 | -181 | 107 | 14 | -4 | -4 | 11 | -6 |
| 2 | -4 | 5 | 15857 | 2734 | 5 | -10 | 1 | -112 | -71 | 8 | -2 | 4 | -21 | 19 | 14 | -4 | -3 | 3 | 23 |
| 2 | -4 | 6 | 2062 | 380 | 5 | -10 | 2 | -126 | 250 | 8 | -2 | 5 | -2 | 2 | 14 | -4 | -2 | 14 | 6 |
| 2 | -4 | 7 | 270 | 52 | 5 | -10 | 3 | -401 | 1 | 8 | -1 | -8 | 1 | -3 | 14 | -4 | -1 | 5 | 52 |
| 2 | -4 | 8 | 54 | 9 | 5 | -10 | 4 | -286 | -589 | 8 | -1 | -7 | -5 | -6 | 14 | -4 | 0 | -9 | 72 |

# Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -4 | 9 | 9 | 1 | 5 | -10 | 5 | 773 | -565 | 8 | -1 | -6 | -13 | -55 | 14 | -4 | 1 | 4 | 8 |
| 2 | -4 | 10 | 1 | 0 | 5 | -10 | 6 | 623 | 666 | 8 | -1 | -5 | -19 | 3 | 14 | -4 | 2 | 1 | 2 |
| 2 | -3 | -8 | 2 | -8 | 5 | -10 | 7 | -282 | 276 | 8 | -1 | -4 | -35 | 28 | 14 | -2 | -8 | -9 | 6 |
| 2 | -3 | -7 | 0 | -2 | 5 | -10 | 8 | -30 | 75 | 8 | -1 | -3 | 70 | 50 | 14 | -2 | -7 | 6 | 5 |
| 2 | -3 | -6 | -0 | 7 | 5 | -10 | 9 | 13 | 38 | 8 | -1 | -2 | -45 | 232 | 14 | -2 | -6 | -17 | 1 |
| 2 | -3 | -5 | 9 | 16 | 5 | -10 | 10 | -27 | 25 | 8 | -1 | -1 | 11 | 282 | 14 | -2 | -5 | -4 | 20 |
| 2 | -3 | -4 | -61 | -69 | 5 | -10 | 11 | 11 | 1 | 8 | -1 | 0 | 47 | 396 | 14 | -2 | -4 | -10 | 0 |
| 2 | -3 | -3 | -579 | -824 | 5 | -10 | 12 | -1 | 5 | 8 | -1 | 1 | 3 | 14 | 14 | -2 | -3 | -23 | 8 |
| 2 | -3 | -2 | -5623 | -6746 | 5 | -10 | 13 | -2 | 3 | 8 | -1 | 3 | 1 | -7 | 14 | -2 | -2 | 3 | -8 |
| 2 | -3 | -1 | -63649 | -43138 | 5 | -10 | 14 | -1 | 1 | 8 | 0 | -7 | 1 | -3 | 14 | -2 | -1 | 0 | 5 |
| 2 | -3 | 0 | -431998 | 471983 | 5 | -9 | -3 | -4 | 3 | 8 | 0 | -6 | -2 | 2 | 14 | 19 | -6 | -2 | -0 |
| 2 | -3 | 1 | 571589 | -271427 | 5 | -9 | -2 | -35 | 24 | 8 | 0 | -5 | 16 | -18 | 14 | 19 | -5 | -18 | -4 |
| 2 | -3 | 2 | -243353 | 226960 | 5 | -9 | -1 | -365 | 238 | 8 | 0 | -4 | 13 | 29 | 14 | 19 | -3 | -24 | -6 |
| 2 | -3 | 3 | 91358 | -2971 | 5 | -9 | 0 | -3638 | 2317 | 8 | 0 | -3 | -2 | 7 | 14 | 19 | -2 | -2 | -0 |
| 2 | -3 | 4 | 17084 | -2120 | 5 | -9 | 1 | -1566 | -3542 | 8 | 0 | -2 | 49 | 129 | 14 | 19 | -1 | 9 | 4 |
| 2 | -3 | 5 | 2440 | -310 | 5 | -9 | 2 | -5299 | 4185 | 8 | 0 | -1 | -95 | 100 | 14 | 19 | 1 | 2 | 1 |
| 2 | -3 | 6 | 308 | -42 | 5 | -9 | 3 | -3030 | -2127 | 8 | 0 | 0 | -49 | 122 | 14 | 20 | -7 | -4 | 1 |
| 2 | -3 | 7 | 43 | -5 | 5 | -9 | 4 | 561 | -3217 | 8 | 0 | 1 | -4 | 9 | 14 | 20 | -6 | -32 | 9 |
| 2 | -3 | 8 | 13 | 1 | 5 | -9 | 5 | 3168 | 448 | 8 | 0 | 2 | -3 | -4 | 14 | 20 | -5 | -284 | 82 |
| 2 | -3 | 9 | 4 | -1 | 5 | -9 | 6 | -325 | 1401 | 8 | 0 | 3 | 0 | -1 | 14 | 20 | -4 | 27 | -7 |
| 2 | -3 | 10 | -1 | -3 | 5 | -9 | 7 | 102 | 242 | 8 | 1 | -7 | 2 | 4 | 14 | 20 | -3 | -265 | 76 |
| 2 | -3 | 11 | -0 | 1 | 5 | -9 | 8 | 2 | 62 | 8 | 1 | -6 | -14 | -9 | 14 | 20 | -2 | -6 | 2 |
| 2 | -2 | -10 | -2 | 4 | 5 | -9 | 9 | -44 | 77 | 8 | 1 | -5 | 13 | 3 | 14 | 20 | -1 | -1 | 0 |
| 2 | -2 | -9 | -2 | -2 | 5 | -9 | 10 | -18 | -3 | 8 | 1 | -4 | -26 | 3 | 14 | 21 | -6 | -5 | 6 |
| 2 | -2 | -8 | -15 | 24 | 5 | -9 | 11 | -5 | 46 | 8 | 1 | -3 | -7 | -9 | 14 | 21 | -5 | -52 | 64 |
| 2 | -2 | -7 | -18 | 9 | 5 | -9 | 12 | -1 | 4 | 8 | 1 | -2 | -2 | 27 | 14 | 21 | -3 | -37 | 45 |
| 2 | -2 | -6 | -12 | -25 | 5 | -9 | 13 | 0 | 4 | 8 | 1 | -1 | -16 | 7 | 14 | 21 | -2 | -5 | 6 |
| 2 | -2 | -5 | 144 | -355 | 5 | -8 | -5 | -3 | 1 | 8 | 1 | 0 | -14 | 15 | 14 | 22 | -6 | -0 | 3 |
| 2 | -2 | -4 | 1133 | -2561 | 5 | -8 | -4 | -23 | 13 | 8 | 1 | 1 | 2 | 1 | 14 | 22 | -5 | -8 | 3 |
| 2 | -2 | -3 | 9830 | -21776 | 5 | -8 | -3 | -213 | 120 | 8 | 1 | 2 | 1 | -0 | 14 | 22 | -4 | -0 | 6 |
| 2 | -2 | -2 | 80852 | -188359 | 5 | -8 | -2 | -1951 | 1096 | 8 | 2 | -7 | 0 | 3 | 14 | 22 | -3 | -5 | 2 |
| 2 | -2 | -1 | 573921 | -1582497 | 5 | -8 | -1 | -18820 | 10592 | 8 | 2 | -6 | 0 | -2 | 14 | 25 | -6 | -2 | -2 |
| 2 | -2 | 0 | -556691 | -561219 | 5 | -8 | 0 | -208231 | 117647 | 8 | 2 | -5 | -11 | 5 | 14 | 25 | -4 | -2 | -2 |
| 2 | -2 | 1 | 579877 | -2107336 | 5 | -8 | 1 | -8389 | 81327 | 8 | 2 | -4 | -1 | -6 | 14 | 26 | -6 | -3 | -3 |
| 2 | -2 | 2 | -162011 | -327163 | 5 | -8 | 2 | -204588 | 106760 | 8 | 2 | -3 | -4 | 7 | 14 | 26 | -4 | -3 | -3 |
| 2 | -2 | 3 | -57138 | -79584 | 5 | -8 | 3 | -26676 | 24293 | 8 | 2 | -1 | -3 | -4 | 15 | -25 | 2 | -2 | 1 |
| 2 | -2 | 4 | -6357 | -11139 | 5 | -8 | 4 | 7400 | -1724 | 8 | 2 | 0 | -1 | 1 | 15 | -25 | 4 | -2 | 1 |
| 2 | -2 | 5 | -647 | -1385 | 5 | -8 | 5 | 1545 | 5620 | 8 | 2 | 1 | -0 | -2 | 15 | -20 | 0 | -1 | -4 |
| 2 | -2 | 6 | -64 | -152 | 5 | -8 | 6 | 803 | 225 | 8 | 3 | -8 | 2 | -1 | 15 | -20 | 1 | -4 | -30 |
| 2 | -2 | 7 | -10 | -37 | 5 | -8 | 7 | 246 | 158 | 8 | 3 | -7 | -1 | 2 | 15 | -20 | 2 | 51 | -31 |
| 2 | -2 | 8 | 5 | -11 | 5 | -8 | 8 | 45 | 71 | 8 | 3 | -4 | -2 | 0 | 15 | -20 | 3 | -9 | -40 |
| 2 | -2 | 9 | -4 | 17 | 5 | -8 | 9 | 10 | -25 | 8 | 3 | -3 | -8 | 3 | 15 | -20 | 4 | 19 | -15 |
| 2 | -2 | 10 | -7 | 18 | 5 | -8 | 10 | -1 | -3 | 8 | 3 | -2 | -37 | 38 | 15 | -19 | -2 | 2 | -4 |
| 2 | -2 | 11 | 2 | -4 | 5 | -8 | 11 | 7 | 12 | 8 | 3 | -1 | -11 | -19 | 15 | -19 | -1 | 16 | -35 |
| 2 | -2 | 12 | -3 | 8 | 5 | -8 | 12 | 2 | 2 | 8 | 3 | 0 | -37 | 38 | 15 | -19 | 0 | 151 | -325 |
| 2 | -1 | -11 | -0 | -5 | 5 | -8 | 13 | 1 | 1 | 8 | 3 | 1 | -5 | 1 | 15 | -19 | 1 | 1580 | -3399 |
| 2 | -1 | -10 | -1 | -4 | 5 | -7 | -5 | -1 | 0 | 8 | 4 | -7 | 3 | 2 | 15 | -19 | 2 | 114 | 71 |
| 2 | -1 | -9 | -0 | -25 | 5 | -7 | -4 | -14 | 5 | 8 | 4 | -6 | -1 | -1 | 15 | -19 | 3 | 1696 | -3675 |
| 2 | -1 | -8 | 7 | -37 | 5 | -7 | -3 | -130 | 37 | 8 | 4 | -5 | -3 | -2 | 15 | -19 | 4 | 191 | -311 |
| 2 | -1 | -7 | 29 | 28 | 5 | -7 | -2 | -1202 | 348 | 8 | 4 | -4 | -1 | -1 | 15 | -19 | 5 | 21 | -31 |
| 2 | -1 | -6 | 53 | 230 | 5 | -7 | -1 | -12022 | 3464 | 8 | 22 | -8 | 3 | -0 | 15 | -19 | 6 | 2 | -4 |
| 2 | -1 | -5 | 623 | 1850 | 5 | -7 | 0 | -144982 | 41767 | 8 | 22 | -7 | 28 | -3 | 15 | -18 | -1 | 8 | -1 |
| 2 | -1 | -4 | 5155 | 15324 | 5 | -7 | 1 | -85742 | 129934 | 8 | 22 | -6 | 268 | -32 | 15 | -18 | 0 | 82 | -6 |
| 2 | -1 | -3 | 41690 | 121413 | 5 | -7 | 2 | -159238 | 2826 | 8 | 22 | -5 | 2873 | -339 | 15 | -18 | 1 | 920 | -66 |
| 2 | -1 | -2 | 301853 | 830576 | 5 | -7 | 3 | -18051 | -13654 | 8 | 22 | -3 | 2876 | -339 | 15 | -18 | 3 | 808 | -58 |
| 2 | -1 | -1 | 302608 | -1248850 | 5 | -7 | 4 | 10923 | 17011 | 8 | 22 | -2 | 268 | -32 | 15 | -18 | 4 | 78 | -6 |
| 2 | -1 | 0 | 817910 | 2811828 | 5 | -7 | 5 | 1361 | -2930 | 8 | 22 | -1 | 28 | -3 | 15 | -18 | 5 | 8 | -1 |
| 2 | -1 | 1 | 378552 | -1050502 | 5 | -7 | 6 | 1307 | -118 | 8 | 22 | 0 | 3 | -0 | 15 | -17 | 0 | 3 | -2 |
| 2 | -1 | 2 | 22718 | -143940 | 5 | -7 | 7 | 367 | 94 | 9 | -17 | 1 | 1 | -1 | 15 | -17 | 1 | 36 | -26 |
| 2 | -1 | 3 | 1911 | -16550 | 5 | -7 | 8 | 79 | 47 | 9 | -17 | 3 | 1 | -1 | 15 | -17 | 3 | 27 | -19 |
| 2 | -1 | 4 | 206 | -1934 | 5 | -7 | 9 | 21 | 3 | 9 | -16 | 0 | 0 | 2 | 15 | -17 | 4 | 3 | -2 |
| 2 | -1 | 5 | -18 | -245 | 5 | -7 | 10 | 36 | 6 | 9 | -16 | 1 | 2 | 28 | 15 | -16 | 0 | 3 | 2 |
| 2 | -1 | 6 | -3 | -15 | 5 | -7 | 11 | 1 | -2 | 9 | -16 | 3 | 2 | 28 | 15 | -16 | 1 | 58 | 26 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -1 | 7 | -18 | -8 | 5 | -7 | 12 | 3 | -1 | 9 | -16 | 4 | 0 | 2 | 15 | -16 | 3 | 37 | 16 |
| 2 | -1 | 8 | -0 | 1 | 5 | -6 | -5 | -6 | -0 | 9 | -15 | 1 | -2 | -0 | 15 | -16 | 4 | 3 | 2 |
| 2 | -1 | 9 | -5 | -5 | 5 | -6 | -4 | -38 | -4 | 9 | -15 | 2 | 0 | -1 | 15 | -15 | 0 | 1 | 3 |
| 2 | -1 | 10 | -3 | -4 | 5 | -6 | -3 | -362 | -58 | 9 | -15 | 3 | -2 | -0 | 15 | -15 | 1 | -32 | 83 |
| 2 | 0 | -9 | 6 | 3 | 5 | -6 | -2 | -3351 | -535 | 9 | -15 | 4 | 0 | -1 | 15 | -15 | 2 | 7 | -6 |
| 2 | 0 | -8 | -4 | 1 | 5 | -6 | -1 | -34881 | -5753 | 9 | -14 | 1 | 8 | -3 | 15 | -15 | 3 | -15 | 39 |
| 2 | 0 | -7 | 15 | 3 | 5 | -6 | 0 | -451838 | -77986 | 9 | -14 | 2 | 5 | -2 | 15 | -15 | 4 | -1 | 4 |
| 2 | 0 | -6 | -103 | -78 | 5 | -6 | 1 | -483264 | 200848 | 9 | -14 | 3 | 5 | 3 | 15 | -14 | -1 | 1 | 2 |
| 2 | 0 | -5 | -479 | -294 | 5 | -6 | 2 | -382216 | -301936 | 9 | -14 | 4 | -2 | 2 | 15 | -14 | 0 | 5 | 9 |
| 2 | 0 | -4 | -3271 | -2511 | 5 | -6 | 3 | -27216 | 36318 | 9 | -14 | 6 | -3 | 3 | 15 | -14 | 1 | -72 | -49 |
| 2 | 0 | -3 | -19862 | -15006 | 5 | -6 | 4 | -30908 | -23897 | 9 | -14 | 7 | -0 | -2 | 15 | -14 | 2 | 15 | 21 |
| 2 | 0 | -2 | -43245 | -35644 | 5 | -6 | 5 | 3158 | -5608 | 9 | -13 | -1 | 0 | -7 | 15 | -14 | 3 | -27 | -17 |
| 2 | 0 | -1 | -58551 | -61071 | 5 | -6 | 6 | 1462 | -977 | 9 | -13 | 0 | -2 | -7 | 15 | -14 | 4 | -3 | -2 |
| 2 | 0 | 0 | -129256 | -100586 | 5 | -6 | 7 | 320 | -97 | 9 | -13 | 1 | 52 | -31 | 15 | -13 | -2 | -1 | 2 |
| 2 | 0 | 1 | 7667 | -10101 | 5 | -6 | 8 | 57 | -8 | 9 | -13 | 2 | -64 | -75 | 15 | -13 | -1 | -4 | 7 |
| 2 | 0 | 2 | 592 | -1267 | 5 | -6 | 9 | -5 | -8 | 9 | -13 | 3 | 13 | -13 | 15 | -13 | 0 | -108 | 21 |
| 2 | 0 | 3 | 89 | -94 | 5 | -6 | 10 | 8 | -5 | 9 | -13 | 4 | -18 | -24 | 15 | -13 | 1 | 108 | -56 |
| 2 | 0 | 4 | 17 | -3 | 5 | -6 | 11 | 1 | -1 | 9 | -13 | 5 | -4 | -7 | 15 | -13 | 2 | -132 | 31 |
| 2 | 0 | 5 | 18 | 9 | 5 | -5 | -6 | -1 | 1 | 9 | -13 | 6 | -7 | -9 | 15 | -13 | 3 | 19 | -22 |
| 2 | 0 | 6 | 8 | 4 | 5 | -5 | -5 | -16 | -7 | 9 | -13 | 7 | 2 | 0 | 15 | -13 | 4 | 1 | -2 |
| 2 | 1 | -13 | -1 | 0 | 5 | -5 | -4 | -126 | -74 | 9 | -12 | -1 | -2 | -1 | 15 | -12 | -2 | 2 | -4 |
| 2 | 1 | -10 | -11 | 1 | 5 | -5 | -3 | -1175 | -707 | 9 | -12 | 0 | -0 | -14 | 15 | -12 | -1 | 20 | -42 |
| 2 | 1 | -9 | 29 | -18 | 5 | -5 | -2 | -11090 | -6894 | 9 | -12 | 1 | 557 | 139 | 15 | -12 | 0 | 49 | -380 |
| 2 | 1 | -8 | -27 | -4 | 5 | -5 | -1 | -119439 | -76022 | 9 | -12 | 2 | -120 | -198 | 15 | -12 | 1 | 2 | -136 |
| 2 | 1 | -7 | -64 | -17 | 5 | -5 | 0 | -1658357 | -1101960 | 9 | -12 | 3 | 265 | 69 | 15 | -12 | 2 | 51 | -348 |
| 2 | 1 | -6 | -457 | -59 | 5 | -5 | 1 | -2147917 | -698964 | 9 | -12 | 4 | 9 | -46 | 15 | -12 | 3 | -8 | -71 |
| 2 | 1 | -5 | -3129 | -603 | 5 | -5 | 2 | -337086 | -954222 | 9 | -12 | 5 | 15 | -2 | 15 | -12 | 4 | -1 | -8 |
| 2 | 1 | -4 | -20027 | -4448 | 5 | -5 | 3 | -558173 | -226540 | 9 | -12 | 7 | -1 | 2 | 15 | -11 | -1 | -1 | 1 |
| 2 | 1 | -3 | -108315 | -27117 | 5 | -5 | 4 | -37068 | -77217 | 9 | -11 | -2 | -3 | -4 | 15 | -11 | 0 | 13 | 9 |
| 2 | 1 | -2 | -270650 | -59938 | 5 | -5 | 5 | -996 | -13902 | 9 | -11 | -1 | -52 | -46 | 15 | -11 | 1 | 15 | 11 |
| 2 | 1 | -1 | -380595 | -108843 | 5 | -5 | 6 | 211 | -2082 | 9 | -11 | 0 | -424 | -415 | 15 | -11 | 2 | 10 | 7 |
| 2 | 1 | 0 | -595414 | -141382 | 5 | -5 | 7 | 68 | -270 | 9 | -11 | 1 | 2944 | 1557 | 15 | -11 | 3 | 5 | 3 |
| 2 | 1 | 1 | -43622 | -11259 | 5 | -5 | 8 | 52 | -59 | 9 | -11 | 2 | -600 | -738 | 15 | -10 | -1 | 1 | 0 |
| 2 | 1 | 2 | -3957 | -1008 | 5 | -5 | 9 | -10 | -16 | 9 | -11 | 3 | 1003 | 564 | 15 | -10 | 0 | 0 | 1 |
| 2 | 1 | 3 | -405 | -109 | 5 | -5 | 10 | 3 | -3 | 9 | -11 | 4 | 225 | 40 | 15 | -10 | 1 | 1 | 0 |
| 2 | 1 | 4 | -65 | 17 | 5 | -4 | -6 | 2 | -5 | 9 | -11 | 5 | 15 | 23 | 15 | -10 | 2 | 0 | 1 |
| 2 | 1 | 5 | -43 | 5 | 5 | -4 | -5 | 16 | -42 | 9 | -11 | 6 | 2 | -4 | 15 | -9 | -1 | 1 | -1 |
| 2 | 1 | 6 | -11 | 12 | 5 | -4 | -4 | 170 | -381 | 9 | -11 | 7 | -3 | -3 | 15 | -9 | 0 | 4 | 6 |
| 2 | 1 | 7 | -8 | 6 | 5 | -4 | -3 | 1588 | -3551 | 9 | -10 | -5 | 7 | -7 | 15 | -9 | 1 | -7 | -7 |
| 2 | 1 | 8 | -6 | -1 | 5 | -4 | -2 | 15688 | -35183 | 9 | -10 | -4 | 59 | -64 | 15 | -9 | 2 | 3 | 4 |
| 2 | 2 | -13 | -3 | 3 | 5 | -4 | -1 | 182855 | -410616 | 9 | -10 | -3 | 514 | -558 | 15 | -9 | 3 | -4 | -3 |
| 2 | 2 | -12 | -5 | 6 | 5 | -4 | 0 | 2177527 | -6430204 | 9 | -10 | -2 | 4653 | -5042 | 15 | -8 | -1 | 1 | 1 |
| 2 | 2 | -11 | -6 | 6 | 5 | -4 | 1 | 812525 | -4157684 | 9 | -10 | -1 | 44282 | -47949 | 15 | -8 | 0 | -5 | 2 |
| 2 | 2 | -10 | -19 | 37 | 5 | -4 | 2 | 963305 | -2758516 | 9 | -10 | 0 | 470230 | -508283 | 15 | -8 | 1 | 16 | -11 |
| 2 | 2 | -9 | 13 | -23 | 5 | -4 | 3 | 273327 | -1166578 | 9 | -10 | 1 | -41451 | 68718 | 15 | -8 | 2 | -5 | 2 |
| 2 | 2 | -8 | -19 | 7 | 5 | -4 | 4 | 39486 | -182158 | 9 | -10 | 2 | 480612 | -521253 | 15 | -8 | 3 | 5 | -4 |
| 2 | 2 | -7 | -33 | 79 | 5 | -4 | 5 | 5087 | -24412 | 9 | -10 | 3 | 30339 | -24911 | 15 | -7 | -2 | 1 | -1 |
| 2 | 2 | -6 | -201 | -20 | 5 | -4 | 6 | 663 | -3118 | 9 | -10 | 4 | 2705 | -1741 | 15 | -7 | -1 | 14 | -11 |
| 2 | 2 | -5 | -1297 | -233 | 5 | -4 | 7 | 70 | -402 | 9 | -10 | 5 | 261 | -166 | 15 | -7 | 0 | 1 | -3 |
| 2 | 2 | -4 | -7865 | -1750 | 5 | -4 | 8 | 16 | -40 | 9 | -10 | 6 | 38 | -13 | 15 | -7 | 1 | 14 | -11 |
| 2 | 2 | -3 | -22180 | -15809 | 5 | -4 | 9 | 2 | -8 | 9 | -10 | 7 | 2 | -2 | 15 | -7 | 2 | 2 | -4 |
| 2 | 2 | -2 | -108997 | 1067 | 5 | -3 | -7 | -0 | 4 | 9 | -9 | -3 | 1 | 7 | 15 | -6 | -3 | 1 | -5 |
| 2 | 2 | -1 | -61602 | -66575 | 5 | -3 | -6 | -4 | 46 | 9 | -9 | -2 | 18 | 71 | 15 | -6 | -2 | 4 | -33 |
| 2 | 2 | 0 | -105242 | -47324 | 5 | -3 | -5 | -65 | 299 | 9 | -9 | -1 | 189 | 733 | 15 | -6 | -1 | 3 | 33 |
| 2 | 2 | 1 | -7890 | -3560 | 5 | -3 | -4 | -583 | 2578 | 9 | -9 | 0 | 3639 | 6570 | 15 | -6 | 0 | 27 | -119 |
| 2 | 2 | 2 | -724 | -306 | 5 | -3 | -3 | -5415 | 22373 | 9 | -9 | 1 | 3351 | 4163 | 15 | -6 | 1 | 3 | 26 |
| 2 | 2 | 3 | -99 | 4 | 5 | -3 | -2 | -43617 | 199488 | 9 | -9 | 2 | 2641 | 5178 | 15 | -6 | 2 | 5 | -1 |
| 2 | 2 | 4 | 26 | -43 | 5 | -3 | -1 | -269777 | 1806349 | 9 | -9 | 3 | 1383 | 1640 | 15 | -5 | -2 | -2 | -0 |
| 2 | 2 | 5 | -23 | 35 | 5 | -3 | 0 | 1510797 | 3315993 | 9 | -9 | 4 | 151 | 222 | 15 | -5 | -1 | -3 | 2 |
| 2 | 2 | 6 | 5 | -6 | 5 | -3 | 1 | -462079 | 1871370 | 9 | -9 | 5 | 46 | 14 | 15 | -5 | 0 | -2 | -0 |
| 2 | 2 | 7 | 23 | -29 | 5 | -3 | 2 | 574337 | 1426022 | 9 | -9 | 6 | -1 | 12 | 15 | -5 | 1 | -3 | 2 |
| 2 | 2 | 9 | -2 | 2 | 5 | -3 | 3 | 76439 | 189941 | 9 | -8 | -3 | -4 | -3 | 15 | -4 | -5 | 2 | 3 |
| 2 | 3 | -12 | 2 | -1 | 5 | -3 | 4 | 9252 | 23169 | 9 | -8 | -2 | -44 | -16 | 15 | -4 | -4 | -6 | 1 |

# Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 3 | -11 | 11 | -9 | 5 | -3 | 5 | 1131 | 2780 | 9 | -8 | -1 | -412 | -160 | 15 | -4 | -3 | 11 | -3 |
| 2 | 3 | -10 | -12 | -10 | 5 | -3 | 6 | 141 | 322 | 9 | -8 | 0 | -2570 | 246 | 15 | -4 | -2 | -5 | -1 |
| 2 | 3 | -9 | 28 | -2 | 5 | -3 | 7 | 31 | 33 | 9 | -8 | 1 | -2257 | 371 | 15 | -4 | -1 | 25 | -16 |
| 2 | 3 | -8 | 3 | -8 | 5 | -3 | 8 | 1 | 5 | 9 | -8 | 2 | -1643 | -47 | 15 | -4 | 0 | 8 | 2 |
| 2 | 3 | -7 | -31 | 59 | 5 | -3 | 9 | 3 | 0 | 9 | -8 | 3 | -677 | 221 | 15 | -4 | 2 | 1 | 3 |
| 2 | 3 | -6 | -153 | 187 | 5 | -2 | -9 | 2 | 3 | 9 | -8 | 4 | -85 | -41 | 15 | -2 | -8 | -3 | 3 |
| 2 | 3 | -5 | -813 | 719 | 5 | -2 | -8 | 17 | 26 | 9 | -8 | 5 | -13 | -14 | 15 | -2 | -7 | 1 | -4 |
| 2 | 3 | -4 | -2087 | 911 | 5 | -2 | -7 | 139 | 211 | 9 | -8 | 6 | -0 | -7 | 15 | -2 | -6 | -1 | 5 |
| 2 | 3 | -3 | -7468 | 6708 | 5 | -2 | -6 | 1127 | 1772 | 9 | -7 | -4 | -1 | -2 | 15 | -2 | -5 | -1 | -4 |
| 2 | 3 | -2 | -23114 | -7888 | 5 | -2 | -5 | 9505 | 14599 | 9 | -7 | -3 | -4 | -11 | 15 | -2 | -4 | 2 | 3 |
| 2 | 3 | -1 | -697 | -14478 | 5 | -2 | -4 | 77904 | 119945 | 9 | -7 | -2 | 41 | -42 | 15 | -2 | -3 | -2 | -0 |
| 2 | 3 | 0 | -14117 | -10246 | 5 | -2 | -3 | 619095 | 958690 | 9 | -7 | -1 | 236 | -359 | 15 | -2 | -2 | 1 | 3 |
| 2 | 3 | 1 | -1064 | -837 | 5 | -2 | -2 | 4249517 | 6707016 | 9 | -7 | 0 | -67 | -1874 | 15 | -2 | 2 | -1 | -3 |
| 2 | 3 | 2 | -76 | -111 | 5 | -2 | -1 | -8145351 | -7137647 | 9 | -7 | 1 | -59 | -1748 | 15 | 18 | -5 | -2 | 0 |
| 2 | 3 | 3 | 21 | -32 | 5 | -2 | 0 | 14023786 | 21624974 | 9 | -7 | 2 | -91 | -1087 | 15 | 18 | -4 | 1 | 0 |
| 2 | 3 | 4 | 40 | -23 | 5 | -2 | 1 | -6882196 | -5365068 | 9 | -7 | 3 | -129 | -420 | 15 | 18 | -3 | -2 | 0 |
| 2 | 3 | 5 | 4 | -6 | 5 | -2 | 2 | -981995 | -676782 | 9 | -7 | 4 | -59 | -117 | 15 | 18 | -2 | 1 | 0 |
| 2 | 3 | 6 | 1 | -1 | 5 | -2 | 3 | -114814 | -77107 | 9 | -7 | 5 | -1 | -9 | 15 | 19 | -7 | -3 | 2 |
| 2 | 3 | 7 | -4 | 4 | 5 | -2 | 4 | -13313 | -8935 | 9 | -6 | -4 | 4 | 1 | 15 | 19 | -6 | -33 | 15 |
| 2 | 4 | -11 | 2 | 2 | 5 | -2 | 5 | -1572 | -1035 | 9 | -6 | -3 | 12 | 3 | 15 | 19 | -5 | -348 | 165 |
| 2 | 4 | -10 | 1 | 2 | 5 | -2 | 6 | -190 | -121 | 9 | -6 | -2 | 3 | 80 | 15 | 19 | -3 | -366 | 169 |
| 2 | 4 | -9 | 3 | 29 | 5 | -2 | 7 | -24 | -17 | 9 | -6 | -1 | 150 | 388 | 15 | 19 | -2 | -33 | 15 |
| 2 | 4 | -8 | 19 | -5 | 5 | -2 | 8 | -3 | -2 | 9 | -6 | 0 | -19 | 579 | 15 | 19 | -1 | 6 | 5 |
| 2 | 4 | -7 | -25 | 59 | 5 | -1 | -10 | 1 | -3 | 9 | -6 | 1 | -377 | 556 | 15 | 20 | -6 | -8 | 6 |
| 2 | 4 | -6 | -80 | 163 | 5 | -1 | -9 | -6 | -1 | 9 | -6 | 2 | 36 | 231 | 15 | 20 | -5 | -88 | 63 |
| 2 | 4 | -5 | -93 | 636 | 5 | -1 | -8 | 16 | -6 | 9 | -6 | 3 | -94 | 40 | 15 | 20 | -4 | -9 | 2 |
| 2 | 4 | -4 | 15 | 2813 | 5 | -1 | -7 | 22 | -11 | 9 | -6 | 4 | -29 | 2 | 15 | 20 | -3 | -73 | 53 |
| 2 | 4 | -3 | -2794 | 1036 | 5 | -1 | -6 | 409 | -126 | 9 | -6 | 5 | -5 | -0 | 15 | 20 | -2 | -3 | 5 |
| 2 | 4 | -2 | -3226 | -3021 | 5 | -1 | -5 | 3302 | -843 | 9 | -5 | -3 | -4 | 5 | 15 | 21 | -6 | -4 | 4 |
| 2 | 4 | -1 | 1489 | -1782 | 5 | -1 | -4 | 26637 | -6856 | 9 | -5 | -2 | -154 | -8 | 15 | 21 | -5 | -39 | 47 |
| 2 | 4 | 0 | -2263 | -2149 | 5 | -1 | -3 | 209613 | -58219 | 9 | -5 | -1 | -749 | 119 | 15 | 21 | -3 | -24 | 29 |
| 2 | 4 | 1 | -169 | -181 | 5 | -1 | -2 | 1435123 | -422738 | 9 | -5 | 0 | 24 | -340 | 15 | 21 | -2 | -4 | 4 |
| 2 | 4 | 2 | -64 | -11 | 5 | -1 | -1 | -28676 | -355199 | 9 | -5 | 1 | -997 | 116 | 15 | 22 | -6 | -0 | 4 |
| 2 | 4 | 3 | -5 | -0 | 5 | -1 | 0 | 3662764 | -1021973 | 9 | -5 | 2 | 16 | -71 | 15 | 22 | -5 | -8 | 3 |
| 2 | 4 | 4 | -4 | 2 | 5 | -1 | 1 | 160304 | -363919 | 9 | -5 | 3 | 12 | -13 | 15 | 22 | -4 | -1 | 9 |
| 2 | 4 | 5 | 1 | 0 | 5 | -1 | 2 | 5945 | -38921 | 9 | -5 | 4 | 2 | -0 | 15 | 22 | -3 | -4 | 1 |
| 2 | 5 | -11 | 1 | 4 | 5 | -1 | 3 | 252 | -4354 | 9 | -4 | -5 | -3 | 2 | 15 | 23 | -6 | -1 | 2 |
| 2 | 5 | -10 | 14 | 9 | 5 | -1 | 4 | 10 | -504 | 9 | -4 | -4 | 0 | 2 | 15 | 23 | -4 | -1 | 2 |
| 2 | 5 | -9 | 8 | 25 | 5 | -1 | 5 | 0 | -55 | 9 | -4 | -3 | 19 | -26 | 15 | 24 | -6 | -3 | -0 |
| 2 | 5 | -8 | 9 | 32 | 5 | -1 | 6 | -1 | -7 | 9 | -4 | -2 | 197 | -334 | 15 | 24 | -4 | -3 | -0 |
| 2 | 5 | -7 | 24 | 24 | 5 | -1 | 8 | -1 | 3 | 9 | -4 | -1 | 256 | -1216 | 15 | 25 | -6 | -2 | -0 |
| 2 | 5 | -6 | 127 | 119 | 5 | 0 | -9 | -6 | 2 | 9 | -4 | 0 | 575 | -1450 | 15 | 25 | -4 | -2 | -0 |
| 2 | 5 | -5 | 489 | 590 | 5 | 0 | -8 | -10 | 37 | 9 | -4 | 1 | 301 | -1296 | 16 | -21 | 1 | -3 | -1 |
| 2 | 5 | -4 | -342 | 836 | 5 | 0 | -7 | -200 | 311 | 9 | -4 | 2 | -12 | -343 | 16 | -21 | 2 | 0 | -3 |
| 2 | 5 | -3 | -492 | -181 | 5 | 0 | -6 | -1737 | 2540 | 9 | -4 | 3 | -5 | -49 | 16 | -21 | 3 | -3 | -1 |
| 2 | 5 | -2 | -1192 | -1363 | 5 | 0 | -5 | -13792 | 20455 | 9 | -4 | 4 | 0 | -7 | 16 | -21 | 4 | 0 | -1 |
| 2 | 5 | -1 | 547 | -78 | 5 | 0 | -4 | -103417 | 153389 | 9 | -3 | -6 | -0 | -5 | 16 | -20 | 0 | -7 | -9 |
| 2 | 5 | 0 | -1285 | -1234 | 5 | 0 | -3 | -661353 | 989271 | 9 | -3 | -5 | -1 | 3 | 16 | -20 | 1 | -61 | -81 |
| 2 | 5 | 1 | -103 | -112 | 5 | 0 | -2 | -1286894 | 2200676 | 9 | -3 | -4 | -10 | 14 | 16 | -20 | 2 | 59 | -103 |
| 2 | 5 | 2 | -17 | -15 | 5 | 0 | -1 | -2572670 | 3656119 | 9 | -3 | -3 | -72 | 96 | 16 | -20 | 3 | -83 | -93 |
| 2 | 6 | -12 | 2 | 1 | 5 | 0 | 0 | -3078015 | 5164979 | 9 | -3 | -2 | -111 | 672 | 16 | -20 | 4 | 15 | -45 |
| 2 | 6 | -11 | 3 | 2 | 5 | 0 | 1 | -225137 | 368855 | 9 | -3 | -1 | -64 | 364 | 16 | -20 | 5 | 3 | -5 |
| 2 | 6 | -10 | 65 | 13 | 5 | 0 | 2 | -20553 | 32862 | 9 | -3 | 0 | -301 | 1724 | 16 | -19 | -4 | -0 | -3 |
| 2 | 6 | -9 | 4 | -2 | 5 | 0 | 3 | -2136 | 3387 | 9 | -3 | 1 | 3 | 156 | 16 | -19 | -3 | -3 | -27 |
| 2 | 6 | -8 | 29 | 4 | 5 | 0 | 4 | -234 | 369 | 9 | -3 | 2 | -2 | 17 | 16 | -19 | -2 | -30 | -238 |
| 2 | 6 | -7 | 53 | 14 | 5 | 0 | 5 | -27 | 42 | 9 | -3 | 3 | 1 | 2 | 16 | -19 | -1 | -266 | -2160 |
| 2 | 6 | -6 | 161 | 50 | 5 | 0 | 6 | -3 | 5 | 9 | -3 | 4 | 2 | -1 | 16 | -19 | 0 | -2547 | -20681 |
| 2 | 6 | -5 | 77 | 266 | 5 | 1 | -11 | -3 | 2 | 9 | -2 | -10 | 0 | -1 | 16 | -19 | 1 | -27604 | -223750 |
| 2 | 6 | -4 | -133 | 99 | 5 | 1 | -10 | 2 | 6 | 9 | -2 | -9 | 1 | -5 | 16 | -19 | 2 | -179 | 444 |
| 2 | 6 | -3 | -17 | -77 | 5 | 1 | -9 | -4 | 15 | 9 | -2 | -8 | 6 | -17 | 16 | -19 | 3 | -27258 | -221106 |
| 2 | 6 | -2 | -80 | -97 | 5 | 1 | -8 | 12 | 86 | 9 | -2 | -7 | -20 | 12 | 16 | -19 | 4 | -2620 | -20588 |
| 2 | 6 | -1 | -32 | -36 | 5 | 1 | -7 | -5 | 304 | 9 | -2 | -6 | 9 | -34 | 16 | -19 | 5 | -277 | -2156 |
| 2 | 6 | 0 | -92 | -76 | 5 | 1 | -6 | -587 | 2593 | 9 | -2 | -5 | 10 | -8 | 16 | -19 | 6 | -30 | -238 |

# Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 6 | 1 | -46 | -7 | 5 | 1 | -5 | -5001 | 16713 | 9 | -2 | -4 | -355 | 932 | 16 | -19 | 7 | -3 | -27 |
| 2 | 6 | 3 | -2 | -0 | 5 | 1 | -4 | -40035 | 86625 | 9 | -2 | -3 | -8270 | -1817 | 16 | -19 | 8 | -0 | -3 |
| 2 | 7 | -12 | 3 | 3 | 5 | 1 | -3 | -287502 | 120382 | 9 | -2 | -2 | -10369 | 15459 | 16 | -18 | 0 | 9 | -5 |
| 2 | 7 | -10 | 103 | -27 | 5 | 1 | -2 | -427499 | 1035570 | 9 | -2 | -1 | -33122 | 2892 | 16 | -18 | 1 | 97 | -87 |
| 2 | 7 | -9 | 66 | -8 | 5 | 1 | -1 | -1067269 | 323002 | 9 | -2 | 0 | -49220 | 14291 | 16 | -18 | 2 | 2 | 2 |
| 2 | 7 | -8 | 36 | -1 | 5 | 1 | 0 | -957723 | 794237 | 9 | -2 | 1 | -3732 | 1223 | 16 | -18 | 3 | 80 | -71 |
| 2 | 7 | -7 | 50 | -5 | 5 | 1 | 1 | -71874 | 59516 | 9 | -2 | 2 | -329 | 117 | 16 | -18 | 4 | 7 | -7 |
| 2 | 7 | -6 | 35 | 66 | 5 | 1 | 2 | -6739 | 5562 | 9 | -2 | 3 | -39 | 15 | 16 | -17 | -1 | 2 | 1 |
| 2 | 7 | -5 | -20 | 58 | 5 | 1 | 3 | -716 | 559 | 9 | -2 | 4 | -3 | 2 | 16 | -17 | 0 | 2 | -3 |
| 2 | 7 | -4 | -30 | 5 | 5 | 1 | 4 | -97 | 46 | 9 | -1 | -7 | 2 | -8 | 16 | -17 | 1 | 37 | -39 |
| 2 | 7 | -3 | -7 | -4 | 5 | 1 | 5 | -11 | 5 | 9 | -1 | -6 | -0 | -19 | 16 | -17 | 3 | 24 | -28 |
| 2 | 7 | -2 | 6 | -6 | 5 | 1 | 6 | -3 | -3 | 9 | -1 | -5 | -11 | 21 | 16 | -17 | 4 | 2 | -3 |
| 2 | 7 | 0 | 4 | -5 | 5 | 2 | -12 | 1 | 1 | 9 | -1 | -4 | 7 | -24 | 16 | -16 | 0 | 2 | 1 |
| 2 | 8 | -12 | -3 | 9 | 5 | 2 | -11 | 4 | 0 | 9 | -1 | -3 | 24 | 14 | 16 | -16 | 1 | 31 | 19 |
| 2 | 8 | -11 | 4 | -8 | 5 | 2 | -10 | 10 | 13 | 9 | -1 | -2 | 29 | 9 | 16 | -16 | 3 | 19 | 12 |
| 2 | 8 | -10 | 45 | -40 | 5 | 2 | -9 | 16 | -18 | 9 | -1 | -1 | 62 | 24 | 16 | -16 | 4 | 2 | 1 |
| 2 | 8 | -9 | 37 | -42 | 5 | 2 | -8 | 64 | 51 | 9 | -1 | 0 | 43 | 52 | 16 | -15 | 0 | 3 | -0 |
| 2 | 8 | -8 | 23 | -13 | 5 | 2 | -7 | 204 | 337 | 9 | -1 | 1 | 5 | 0 | 16 | -15 | 1 | -16 | 16 |
| 2 | 8 | -7 | 7 | -3 | 5 | 2 | -6 | 1077 | 2159 | 9 | -1 | 2 | -7 | 9 | 16 | -15 | 2 | 6 | -0 |
| 2 | 8 | -6 | -11 | 30 | 5 | 2 | -5 | 3068 | 9923 | 9 | -1 | 3 | -1 | 1 | 16 | -15 | 3 | -9 | 8 |
| 2 | 8 | -5 | -3 | 9 | 5 | 2 | -4 | -15633 | 17839 | 9 | 0 | -6 | -3 | 2 | 16 | -14 | -1 | -0 | 2 |
| 2 | 8 | -4 | -9 | 7 | 5 | 2 | -3 | 29284 | 79813 | 9 | 0 | -5 | 7 | -9 | 16 | -14 | 0 | 1 | 14 |
| 2 | 8 | -3 | 9 | -14 | 5 | 2 | -2 | -194834 | 193400 | 9 | 0 | -4 | 2 | 2 | 16 | -14 | 1 | -4 | -8 |
| 2 | 8 | -2 | 3 | 3 | 5 | 2 | -1 | -174279 | -79725 | 9 | 0 | -3 | -4 | -9 | 16 | -14 | 2 | 1 | 20 |
| 2 | 8 | -1 | 1 | -3 | 5 | 2 | 0 | -185752 | 83506 | 9 | 0 | -2 | 9 | -9 | 16 | -14 | 3 | -1 | -0 |
| 2 | 9 | -13 | 0 | 1 | 5 | 2 | 1 | -14511 | 6598 | 9 | 0 | -1 | -28 | -10 | 16 | -13 | -2 | -1 | -1 |
| 2 | 9 | -12 | 1 | 14 | 5 | 2 | 2 | -1408 | 645 | 9 | 0 | 0 | 2 | 7 | 16 | -13 | -1 | -21 | -0 |
| 2 | 9 | -11 | -7 | -8 | 5 | 2 | 3 | -148 | 69 | 9 | 0 | 1 | -4 | -2 | 16 | -13 | 0 | -309 | -93 |
| 2 | 9 | -10 | 14 | -5 | 5 | 2 | 4 | -20 | 10 | 9 | 1 | -7 | -0 | 2 | 16 | -13 | 1 | 92 | 12 |
| 2 | 9 | -9 | -3 | -4 | 5 | 2 | 5 | -0 | -2 | 9 | 1 | -6 | -3 | -4 | 16 | -13 | 2 | -331 | -96 |
| 2 | 9 | -8 | 0 | -12 | 5 | 3 | -11 | 1 | -4 | 9 | 1 | -5 | -5 | 3 | 16 | -13 | 3 | -8 | -13 |
| 2 | 9 | -7 | 15 | 10 | 5 | 3 | -10 | 11 | 17 | 9 | 1 | -4 | -4 | -4 | 16 | -13 | 4 | -1 | -1 |
| 2 | 9 | -6 | -10 | 22 | 5 | 3 | -9 | 6 | -46 | 9 | 1 | -3 | 2 | 1 | 16 | -12 | -1 | 1 | -2 |
| 2 | 9 | -5 | 7 | 5 | 5 | 3 | -8 | 69 | -0 | 9 | 1 | -2 | 0 | -2 | 16 | -12 | 0 | 13 | -20 |
| 2 | 9 | -4 | -3 | 8 | 5 | 3 | -7 | 429 | 151 | 9 | 1 | -1 | -2 | 3 | 16 | -12 | 2 | 11 | -17 |
| 2 | 9 | -3 | -0 | 1 | 5 | 3 | -6 | 1535 | 969 | 9 | 1 | 0 | 0 | 1 | 16 | -12 | 3 | 1 | -2 |
| 2 | 10 | -12 | 2 | 16 | 5 | 3 | -5 | 1647 | 3444 | 9 | 1 | 1 | -2 | -1 | 16 | 6 | -3 | -0 | 1 |
| 2 | 10 | -11 | -5 | 5 | 5 | 3 | -4 | 24411 | 5841 | 9 | 2 | -6 | -1 | 2 | 16 | 6 | -1 | -0 | 1 |
| 2 | 10 | -10 | -3 | 0 | 5 | 3 | -3 | -1628 | 28855 | 9 | 2 | -5 | 1 | 1 | 16 | 18 | -5 | -2 | 4 |
| 2 | 10 | -9 | -2 | -2 | 5 | 3 | -2 | -53729 | 18417 | 9 | 2 | -4 | -1 | 2 | 16 | 18 | -3 | -2 | 4 |
| 2 | 10 | -8 | -12 | 0 | 5 | 3 | -1 | -12501 | -30964 | 9 | 2 | -3 | -3 | -3 | 16 | 19 | -7 | 1 | 4 |
| 2 | 10 | -7 | 0 | -17 | 5 | 3 | 0 | -40503 | 10403 | 10 | -23 | 2 | 0 | 1 | 16 | 19 | -6 | 9 | 37 |
| 2 | 10 | -6 | 6 | -2 | 5 | 3 | 1 | -3389 | 868 | 10 | -23 | 4 | 0 | 1 | 16 | 19 | -5 | 98 | 402 |
| 2 | 11 | -12 | 1 | 4 | 5 | 3 | 2 | -342 | 89 | 10 | -18 | 1 | -0 | -4 | 16 | 19 | -3 | 94 | 383 |
| 2 | 11 | -11 | -3 | 1 | 5 | 3 | 3 | -37 | 4 | 10 | -18 | 3 | -0 | -4 | 16 | 19 | -2 | 9 | 37 |
| 2 | 11 | -10 | -0 | 3 | 5 | 3 | 4 | -3 | 1 | 10 | -17 | 0 | 2 | 0 | 16 | 19 | -1 | 1 | 4 |
| 2 | 11 | -9 | -2 | -0 | 5 | 4 | -12 | 3 | -1 | 10 | -17 | 1 | 16 | 1 | 16 | 20 | -6 | 2 | 3 |
| 2 | 11 | -8 | -1 | -1 | 5 | 4 | -11 | 16 | -6 | 10 | -17 | 3 | 16 | 1 | 16 | 20 | -5 | 15 | 34 |
| 2 | 11 | -7 | 1 | -1 | 5 | 4 | -10 | -11 | -16 | 10 | -17 | 4 | 2 | 0 | 16 | 20 | -3 | 11 | 25 |
| 3 | -14 | 7 | -2 | -1 | 5 | 4 | -9 | 31 | 2 | 10 | -16 | 1 | -4 | 9 | 16 | 20 | -2 | 2 | 3 |
| 3 | -14 | 8 | -1 | -3 | 5 | 4 | -8 | 95 | -30 | 10 | -16 | 3 | -4 | 9 | 16 | 21 | -6 | -0 | 1 |
| 3 | -14 | 9 | -1 | -3 | 5 | 4 | -7 | 342 | -23 | 10 | -15 | 1 | -1 | -9 | 16 | 21 | -5 | -2 | 14 |
| 3 | -14 | 10 | 2 | -5 | 5 | 4 | -6 | 1010 | 152 | 10 | -15 | 2 | -0 | -8 | 16 | 21 | -3 | -1 | 7 |
| 3 | -14 | 11 | 1 | -2 | 5 | 4 | -5 | 6123 | -2563 | 10 | -15 | 3 | -1 | -6 | 16 | 21 | -2 | -0 | 1 |
| 3 | -14 | 12 | 4 | -2 | 5 | 4 | -4 | 6246 | 6163 | 10 | -15 | 4 | -1 | -2 | 16 | 24 | -6 | -2 | 1 |
| 3 | -13 | 0 | -1 | -3 | 5 | 4 | -3 | -5830 | 2668 | 10 | -14 | 0 | 0 | -1 | 16 | 24 | -4 | -2 | 1 |
| 3 | -13 | 2 | -9 | -16 | 5 | 4 | -2 | -49451 | 9539 | 10 | -14 | 1 | 15 | -34 | 16 | 25 | -7 | -2 | 1 |
| 3 | -13 | 4 | -1 | -3 | 5 | 4 | -1 | 5055 | -12038 | 10 | -14 | 2 | -3 | -1 | 16 | 25 | -6 | -22 | 9 |
| 3 | -13 | 5 | -3 | 8 | 5 | 4 | 0 | -49165 | 10273 | 10 | -14 | 3 | 23 | -16 | 16 | 25 | -4 | -22 | 9 |
| 3 | -13 | 6 | -11 | 13 | 5 | 4 | 1 | -4462 | 943 | 10 | -14 | 4 | -3 | -2 | 16 | 25 | -3 | -2 | 1 |
| 3 | -13 | 7 | -18 | 1 | 5 | 4 | 2 | -463 | 91 | 10 | -14 | 5 | 6 | 5 | 17 | -13 | -1 | 1 | 3 |
| 3 | -13 | 8 | -12 | -21 | 5 | 4 | 3 | -51 | 10 | 10 | -14 | 6 | -3 | 2 | 17 | -13 | 0 | 10 | 32 |
| 3 | -13 | 9 | -8 | 16 | 5 | 4 | 4 | -6 | 1 | 10 | -13 | -1 | 2 | -2 | 17 | -13 | 2 | 10 | 32 |

# Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | -13 | 10 | 8 | -13 | 5 | 5 | -13 | 1 | -2 | 10 | -13 | 0 | 2 | -10 | 17 | -13 | 3 | 1 | 3 |
| 3 | -13 | 11 | 11 | -4 | 5 | 5 | -12 | 2 | -3 | 10 | -13 | 1 | 151 | -263 | 17 | 12 | -4 | 3 | 0 |
| 3 | -13 | 12 | 10 | -1 | 5 | 5 | -11 | 40 | -40 | 10 | -13 | 2 | -107 | 29 | 17 | 12 | -2 | 3 | 0 |
| 3 | -13 | 13 | 2 | 0 | 5 | 5 | -10 | -14 | -14 | 10 | -13 | 3 | 71 | -131 | 18 | 11 | -4 | 2 | 1 |
| 3 | -12 | 3 | 7 | -3 | 5 | 5 | -9 | 19 | -29 | 10 | -13 | 4 | -22 | -17 | 18 | 11 | -2 | 2 | 1 |
| 3 | -12 | 4 | 14 | -3 | 5 | 5 | -8 | 48 | -44 | 10 | -13 | 5 | -3 | -8 | 18 | 12 | -4 | 0 | -2 |
| 3 | -12 | 5 | 32 | -5 | 5 | 5 | -7 | 247 | -182 | 10 | -13 | 6 | -1 | -8 | 18 | 12 | -2 | 0 | -2 |
| 3 | -12 | 6 | 24 | -18 | 5 | 5 | -6 | 932 | -1473 | 10 | -12 | -2 | -2 | 1 | 18 | 13 | -4 | -1 | -2 |
| 3 | -12 | 7 | 19 | 12 | 5 | 5 | -5 | 2592 | 339 | 10 | -12 | -1 | -8 | 7 | 18 | 13 | -2 | -1 | -2 |
| 3 | -12 | 8 | -14 | 19 | 5 | 5 | -4 | 281 | 1767 | 10 | -12 | 0 | -38 | 10 | 19 | -14 | -1 | 1 | 0 |
| 3 | -12 | 9 | -21 | 31 | 5 | 5 | -3 | -951 | 397 | 10 | -12 | 1 | 793 | -789 | 19 | -14 | 0 | 11 | 3 |
| 3 | -12 | 10 | -3 | 22 | 5 | 5 | -2 | -775 | -149 | 10 | -12 | 2 | -161 | -23 | 19 | -14 | 2 | 11 | 3 |
| 3 | -12 | 11 | -3 | 8 | 5 | 5 | -1 | -413 | 159 | 10 | -12 | 3 | 297 | -314 | 19 | -14 | 3 | 1 | 0 |
| 3 | -12 | 12 | 7 | -5 | 5 | 5 | 0 | -559 | 129 | 10 | -12 | 4 | 43 | -88 | 19 | 5 | -3 | 4 | 5 |
| 3 | -11 | 1 | -1 | 2 | 5 | 5 | 1 | -52 | 11 | 10 | -12 | 5 | 11 | 2 | 19 | 5 | -1 | 4 | 5 |
| 3 | -11 | 3 | -2 | -0 | 5 | 5 | 2 | -6 | 1 | 10 | -12 | 6 | 0 | 3 | 19 | 11 | -5 | -10 | -7 |
| 3 | -11 | 4 | 4 | -6 | 5 | 6 | -13 | 1 | -3 | 10 | -12 | 7 | 3 | 4 | 19 | 11 | -4 | -99 | -76 |
| 3 | -11 | 5 | 18 | -8 | 5 | 6 | -12 | 3 | -14 | 10 | -12 | 8 | -5 | 5 | 19 | 11 | -2 | -105 | -81 |
| 3 | -11 | 6 | 25 | 16 | 5 | 6 | -11 | 6 | -8 | 10 | -12 | 9 | -1 | -2 | 19 | 11 | -1 | -10 | -7 |
| 3 | -11 | 7 | -9 | 17 | 5 | 6 | -10 | -47 | -24 | 10 | -11 | -3 | -2 | -3 | 19 | 12 | -5 | 3 | -2 |
| 3 | -11 | 8 | 8 | 30 | 5 | 6 | -9 | -12 | -67 | 10 | -11 | -2 | -13 | -20 | 19 | 12 | -4 | 35 | -21 |
| 3 | -11 | 9 | -15 | 57 | 5 | 6 | -8 | 28 | -90 | 10 | -11 | -1 | -157 | -227 | 19 | 12 | -2 | 30 | -18 |
| 3 | -11 | 10 | -30 | 64 | 5 | 6 | -7 | -22 | -469 | 10 | -11 | 0 | -1417 | -2087 | 19 | 12 | -1 | 3 | -2 |
| 3 | -11 | 11 | -8 | 21 | 5 | 6 | -6 | 694 | -373 | 10 | -11 | 1 | 3288 | 3169 | 19 | 13 | -4 | 3 | 12 |
| 3 | -11 | 12 | -1 | 6 | 5 | 6 | -5 | 421 | 369 | 10 | -11 | 2 | -1856 | -2731 | 19 | 13 | -2 | 2 | 8 |
| 3 | -11 | 13 | -0 | 1 | 5 | 6 | -4 | -110 | 227 | 10 | -11 | 3 | 990 | 919 | 19 | 14 | -4 | -6 | 0 |
| 3 | -10 | 0 | -0 | -1 | 5 | 6 | -3 | -85 | -28 | 10 | -11 | 4 | 176 | 140 | 19 | 14 | -2 | -3 | 0 |
| 3 | -10 | 1 | -1 | -2 | 5 | 6 | -2 | 2 | -32 | 10 | -11 | 5 | 5 | 21 | 20 | 10 | -4 | 9 | -0 |
| 3 | -10 | 2 | -13 | -1 | 5 | 6 | -1 | -15 | -10 | 10 | -11 | 6 | -14 | -7 | 20 | 10 | -2 | 9 | -0 |
| 3 | -10 | 3 | -12 | -23 | 5 | 6 | 0 | -6 | 2 | 10 | -11 | 7 | -12 | -2 | 20 | 11 | -6 | -2 | 9 |
| 3 | -10 | 4 | 29 | -41 | 5 | 7 | -14 | -1 | -2 | 10 | -11 | 8 | -9 | -4 | 20 | 11 | -5 | -23 | 84 |
| 3 | -10 | 5 | 61 | -3 | 5 | 7 | -13 | -1 | -2 | 10 | -10 | -4 | 2 | -0 | 20 | 11 | -4 | -246 | 915 |
| 3 | -10 | 6 | 41 | 47 | 5 | 7 | -12 | -23 | -47 | 10 | -10 | -3 | 23 | -4 | 20 | 11 | -2 | -239 | 889 |
| 3 | -10 | 7 | 13 | 77 | 5 | 7 | -11 | 4 | -10 | 10 | -10 | -2 | 212 | -40 | 20 | 11 | -1 | -23 | 84 |
| 3 | -10 | 8 | 1 | 30 | 5 | 7 | -10 | -24 | -27 | 10 | -10 | -1 | 2055 | -449 | 20 | 11 | 0 | -2 | 9 |
| 3 | -10 | 9 | -1 | 62 | 5 | 7 | -9 | -34 | -8 | 10 | -10 | 0 | 21409 | -6555 | 20 | 12 | -5 | -2 | -1 |
| 3 | -10 | 10 | 20 | 70 | 5 | 7 | -8 | -82 | -101 | 10 | -10 | 1 | 7086 | -3983 | 20 | 12 | -4 | -25 | -15 |
| 3 | -10 | 12 | 3 | 11 | 5 | 7 | -7 | 85 | -213 | 10 | -10 | 2 | 19481 | -5685 | 20 | 12 | -2 | -20 | -12 |
| 3 | -10 | 13 | 0 | 2 | 5 | 7 | -6 | 194 | 11 | 10 | -10 | 3 | 3989 | -1965 | 20 | 12 | -1 | -2 | -1 |
| 3 | -9 | -1 | -4 | -5 | 5 | 7 | -5 | 16 | 77 | 10 | -10 | 4 | 493 | -266 | 20 | 13 | -4 | 10 | -9 |
| 3 | -9 | 0 | -10 | -43 | 5 | 7 | -4 | -19 | 7 | 10 | -10 | 5 | 48 | -7 | 20 | 13 | -2 | 6 | -6 |
| 3 | -9 | 1 | 36 | -73 | 5 | 7 | -3 | -0 | -6 | 10 | -10 | 6 | -19 | -36 | 20 | 14 | -4 | 4 | 6 |
| 3 | -9 | 2 | -120 | -107 | 5 | 7 | -2 | 4 | -3 | 10 | -10 | 7 | 27 | -1 | 20 | 14 | -2 | 2 | 3 |
| 3 | -9 | 3 | 40 | -214 | 5 | 7 | 0 | 1 | -0 | 10 | -10 | 8 | -3 | 1 | 21 | 10 | -5 | 1 | 0 |
| 3 | -9 | 4 | 247 | -156 | 5 | 8 | -15 | -2 | -1 | 10 | -9 | -3 | -3 | 5 | 21 | 10 | -4 | 13 | 1 |
| 3 | -9 | 5 | 330 | 96 | 5 | 8 | -14 | -7 | -3 | 10 | -9 | -2 | -1 | 33 | 21 | 10 | -2 | 13 | 1 |
| 3 | -9 | 6 | 166 | 158 | 5 | 8 | -13 | 2 | -0 | 10 | -9 | -1 | -144 | 285 | 21 | 10 | -1 | 1 | 0 |
| 3 | -9 | 7 | 20 | -3 | 5 | 8 | -12 | -31 | -20 | 10 | -9 | 0 | -33 | 2206 | 21 | 11 | -5 | -1 | 2 |
| 3 | -9 | 8 | 22 | 13 | 5 | 8 | -11 | -20 | -18 | 10 | -9 | 1 | 286 | 1635 | 21 | 11 | -4 | -11 | 25 |
| 3 | -9 | 9 | 15 | 31 | 5 | 8 | -10 | -5 | -4 | 10 | -9 | 2 | -210 | 1719 | 21 | 11 | -2 | -10 | 22 |
| 3 | -9 | 10 | 33 | 26 | 5 | 8 | -9 | -30 | -14 | 10 | -9 | 3 | 63 | 495 | 21 | 11 | -1 | -1 | 2 |
| 3 | -9 | 11 | 4 | 2 | 5 | 8 | -8 | -9 | -56 | 10 | -9 | 4 | 55 | 101 | 21 | 12 | -4 | -5 | -4 |
| 3 | -9 | 12 | 2 | 1 | 5 | 8 | -7 | 43 | -30 | 10 | -9 | 5 | -17 | -16 | 21 | 12 | -2 | -5 | -4 |
| 3 | -8 | -3 | -3 | -6 | 5 | 8 | -6 | 23 | 15 | 10 | -9 | 6 | 36 | -39 | 22 | 10 | -6 | 2 | 1 |
| 3 | -8 | -2 | -22 | -55 | 5 | 8 | -5 | -4 | 7 | 10 | -9 | 7 | 6 | -7 | 22 | 10 | -5 | 18 | 6 |
| 3 | -8 | -1 | -190 | -530 | 5 | 8 | -4 | -2 | 2 | 10 | -8 | -3 | 2 | -3 | 22 | 10 | -4 | 193 | 60 |
| 3 | -8 | 0 | -1909 | -5443 | 5 | 8 | -3 | 1 | -3 | 10 | -8 | -2 | -11 | 2 | 22 | 10 | -2 | 196 | 61 |
| 3 | -8 | 1 | 2678 | -905 | 5 | 9 | -14 | -2 | -1 | 10 | -8 | -1 | -142 | -72 | 22 | 10 | -1 | 18 | 6 |
| 3 | -8 | 2 | -2786 | -6758 | 5 | 9 | -13 | -24 | 5 | 10 | -8 | 0 | -898 | 882 | 22 | 10 | 0 | 2 | 1 |
| 3 | -8 | 3 | 1399 | -1879 | 5 | 9 | -12 | -47 | -6 | 10 | -8 | 1 | -296 | 1009 | 22 | 16 | -5 | -3 | 6 |
| 3 | -8 | 4 | 1282 | -553 | 5 | 9 | -11 | -16 | -11 | 10 | -8 | 2 | -1146 | 624 | 22 | 16 | -3 | -3 | 6 |
| 3 | -8 | 5 | 937 | 74 | 5 | 9 | -10 | -12 | -35 | 10 | -8 | 3 | -50 | 253 | 23 | 16 | -7 | -2 | 2 |
| 3 | -8 | 6 | 153 | -35 | 5 | 9 | -9 | -7 | -9 | 10 | -8 | 4 | -82 | 72 | 23 | 16 | -6 | -14 | 20 |

## Table 2 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | -8 | 7 | 54 | 39 | 5 | 9 | -8 | 31 | -32 | 10 | -8 | 5 | -35 | 46 | 23 | 16 | -5 | -154 | 211 |
| 3 | -8 | 8 | 19 | 21 | 5 | 9 | -7 | 8 | -0 | 10 | -8 | 6 | -1 | -32 | 23 | 16 | -3 | -154 | 211 |
| 3 | -8 | 9 | 10 | 5 | 5 | 9 | -6 | 9 | -1 | 10 | -8 | 7 | 1 | -2 | 23 | 16 | -2 | -14 | 20 |
| 3 | -8 | 10 | 9 | 2 | 5 | 9 | -5 | -1 | 3 | 10 | -7 | -4 | -1 | -2 | 23 | 16 | -1 | -2 | 2 |
| 3 | -8 | 11 | 3 | -0 | 5 | 9 | -4 | 2 | -4 | 10 | -7 | -3 | -4 | -8 | 25 | 15 | -5 | 2 | 2 |
| 3 | -7 | -4 | -2 | -7 | 5 | 9 | -3 | 5 | -3 | 10 | -7 | -2 | -2 | 26 | 25 | 15 | -3 | 2 | 2 |
| 3 | -7 | -3 | -23 | -69 | 5 | 10 | -14 | 5 | -7 | 10 | -7 | -1 | -74 | 205 | | | | | |

Table 3. Fourier representation of $\delta z_{2mjk}$ (periodic part). The coefficients are in units of $10^{-13}$

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 26 | 93 | 2 | 1 | -2 | -544 | 5 | 4 | 1 | 1 | 4 | -3 | 6 | -2 | -2 | -522 | -772 |
| 0 | 0 | 1 | 52 | 243 | 2 | 1 | -1 | -13438 | -10596 | 4 | 2 | -5 | 4 | -2 | 6 | -2 | -1 | -7579 | 4465 |
| 0 | 0 | 2 | 3 | 12 | 2 | 1 | 0 | 2881 | 2044 | 4 | 2 | -4 | -1 | -12 | 6 | -2 | 0 | 1776 | -1815 |
| 0 | 0 | 3 | 0 | 3 | 2 | 1 | 1 | 198 | 172 | 4 | 2 | -3 | -30 | -40 | 6 | -2 | 1 | -4401 | -5596 |
| 0 | 1 | -4 | 0 | -4 | 2 | 1 | 2 | 12 | 9 | 4 | 2 | -2 | 52 | -82 | 6 | -2 | 2 | -197 | -266 |
| 0 | 1 | -3 | 62 | 57 | 2 | 2 | -7 | 2 | -7 | 4 | 2 | -1 | -26 | 12 | 6 | -2 | 3 | -13 | -17 |
| 0 | 1 | -2 | 516 | 575 | 2 | 2 | -6 | 5 | -1 | 4 | 2 | 0 | 6 | -1 | 6 | -2 | 4 | -2 | -2 |
| 0 | 1 | -1 | 10413 | 7802 | 2 | 2 | -5 | -4 | 3 | 4 | 3 | -4 | -17 | 2 | 6 | -1 | -5 | -1 | 1 |
| 0 | 1 | 0 | -1894 | -1347 | 2 | 2 | -4 | 26 | 28 | 4 | 3 | -3 | -0 | -21 | 6 | -1 | -4 | -2 | 2 |
| 0 | 1 | 1 | 332 | -175 | 2 | 2 | -3 | 335 | -51 | 4 | 3 | -2 | 15 | -16 | 6 | -1 | -3 | -20 | -5 |
| 0 | 1 | 2 | 17 | -13 | 2 | 2 | -2 | 3428 | -151 | 4 | 3 | -1 | -8 | 4 | 6 | -1 | -2 | 86 | -117 |
| 0 | 1 | 3 | 1 | -2 | 2 | 2 | -1 | -1342 | -1852 | 4 | 4 | -5 | 5 | -0 | 6 | -1 | -1 | -129 | -311 |
| 0 | 2 | -5 | 1 | -7 | 2 | 2 | 0 | 305 | 446 | 4 | 4 | -3 | -5 | 0 | 6 | -1 | 0 | 20 | 73 |
| 0 | 2 | -4 | 27 | -2 | 2 | 2 | 1 | 24 | 32 | 5 | -11 | 5 | 0 | -12 | 6 | -1 | 1 | 8 | 12 |
| 0 | 2 | -3 | -19 | 146 | 2 | 2 | 2 | 2 | 2 | 5 | -11 | 6 | 6 | 2 | 6 | 0 | -4 | 7 | 2 |
| 0 | 2 | -2 | -621 | -201 | 2 | 3 | -7 | -1 | 1 | 5 | -11 | 7 | 0 | -12 | 6 | 0 | -2 | -20 | -14 |
| 0 | 2 | -1 | -638 | 1 | 2 | 3 | -6 | -6 | 15 | 5 | -11 | 8 | 6 | -1 | 6 | 0 | -1 | -17 | 26 |
| 0 | 2 | 0 | 219 | 10 | 2 | 3 | -5 | 7 | -6 | 5 | -10 | 2 | 1 | 1 | 6 | 0 | 0 | 2 | -12 |
| 0 | 2 | 1 | 40 | 2 | 2 | 3 | -4 | 63 | -43 | 5 | -10 | 3 | -9 | 3 | 6 | 1 | -2 | -20 | -6 |
| 0 | 2 | 2 | 2 | 0 | 2 | 3 | -3 | 441 | -237 | 5 | -10 | 4 | 8 | 2 | 6 | 1 | -1 | 3 | 1 |
| 0 | 3 | -4 | -10 | 8 | 2 | 3 | -2 | 957 | 488 | 5 | -10 | 5 | -9 | 26 | 6 | 1 | 0 | 2 | -1 |
| 0 | 3 | -3 | 28 | -3 | 2 | 3 | -1 | -131 | -224 | 5 | -10 | 6 | -26 | -9 | 6 | 2 | -3 | -2 | -6 |
| 0 | 3 | -2 | 219 | 21 | 2 | 3 | 0 | 21 | 62 | 5 | -10 | 7 | -4 | -12 | 6 | 2 | -1 | -2 | -6 |
| 0 | 3 | -1 | 45 | -35 | 2 | 3 | 1 | 0 | 5 | 5 | -10 | 8 | 15 | -13 | 7 | -10 | 0 | 3 | -3 |
| 0 | 3 | 0 | -17 | 10 | 2 | 4 | -7 | 2 | 1 | 5 | -10 | 9 | -2 | 1 | 7 | -10 | 1 | -8 | -2 |
| 0 | 3 | 1 | -1 | 1 | 2 | 4 | -6 | 7 | 5 | 5 | -9 | 0 | -2 | 7 | 7 | -10 | 2 | 52 | 19 |
| 0 | 4 | -3 | 35 | -23 | 2 | 4 | -5 | 6 | -28 | 5 | -9 | 1 | 24 | -33 | 7 | -10 | 3 | 2 | 1 |
| 0 | 4 | -2 | -4 | 75 | 2 | 4 | -4 | 45 | -92 | 5 | -9 | 2 | -163 | 231 | 7 | -9 | -1 | -7 | 1 |
| 0 | 4 | -1 | 3 | -9 | 2 | 4 | -3 | 140 | -4 | 5 | -9 | 3 | 97 | 14 | 7 | -9 | 0 | -154 | 31 |
| 0 | 4 | 0 | -4 | -4 | 2 | 4 | -2 | 117 | 196 | 5 | -9 | 4 | 28 | 114 | 7 | -9 | 1 | -30 | 102 |
| 1 | -8 | 3 | -12 | -0 | 2 | 4 | -1 | -14 | -29 | 5 | -9 | 5 | -98 | 35 | 7 | -9 | 2 | 371 | -714 |
| 1 | -8 | 4 | 2 | -5 | 2 | 4 | 0 | -0 | 6 | 5 | -9 | 6 | -18 | -37 | 7 | -9 | 3 | 18 | -28 |
| 1 | -8 | 5 | -12 | -0 | 2 | 5 | -7 | -1 | 6 | 5 | -9 | 7 | 3 | -24 | 7 | -9 | 4 | 1 | -2 |
| 1 | -8 | 6 | -1 | -6 | 2 | 5 | -6 | -8 | -11 | 5 | -9 | 8 | -7 | 7 | 7 | -8 | -1 | 0 | -4 |
| 1 | -7 | 0 | -4 | 5 | 2 | 5 | -5 | -17 | -24 | 5 | -9 | 9 | -3 | -5 | 7 | -8 | 0 | -1 | -79 |
| 1 | -7 | 1 | 25 | 1 | 2 | 5 | -4 | 25 | -24 | 5 | -8 | -1 | 2 | -7 | 7 | -8 | 1 | -10 | 57 |
| 1 | -7 | 2 | -168 | -20 | 2 | 5 | -3 | 21 | 11 | 5 | -8 | 0 | 35 | -154 | 7 | -8 | 2 | 118 | 128 |
| 1 | -7 | 3 | 11 | 21 | 2 | 5 | -2 | 8 | 65 | 5 | -8 | 1 | -515 | 376 | 7 | -8 | 3 | -9 | 11 |
| 1 | -7 | 4 | -30 | 26 | 2 | 5 | -1 | -12 | -1 | 5 | -8 | 2 | 3664 | -2256 | 7 | -7 | -1 | 6 | 14 |
| 1 | -7 | 5 | -20 | -10 | 2 | 5 | 0 | 1 | 2 | 5 | -8 | 3 | 573 | 220 | 7 | -7 | 0 | 79 | 31 |
| 1 | -7 | 6 | -3 | -2 | 2 | 6 | -6 | -5 | -2 | 5 | -8 | 4 | -208 | 372 | 7 | -7 | 1 | -81 | -18 |
| 1 | -7 | 7 | 0 | 4 | 2 | 6 | -5 | 1 | -6 | 5 | -8 | 5 | -158 | -123 | 7 | -7 | 2 | -127 | 144 |
| 1 | -6 | 0 | 16 | -3 | 2 | 6 | -4 | -5 | -2 | 5 | -8 | 6 | 10 | -31 | 7 | -7 | 3 | -9 | 2 |
| 1 | -6 | 1 | -75 | -48 | 2 | 6 | -3 | 1 | -6 | 5 | -8 | 7 | -1 | -4 | 7 | -7 | 4 | 5 | -5 |
| 1 | -6 | 2 | 511 | 375 | 3 | -9 | 3 | 0 | -6 | 5 | -8 | 8 | -1 | 8 | 7 | -6 | -2 | -2 | 1 |
| 1 | -6 | 3 | -20 | 190 | 3 | -9 | 4 | -23 | -10 | 5 | -7 | -2 | 1 | -1 | 7 | -6 | -1 | -43 | 15 |
| 1 | -6 | 4 | -102 | 15 | 3 | -9 | 5 | 3 | -4 | 5 | -7 | -1 | 11 | -19 | 7 | -6 | 0 | -35 | 113 |
| 1 | -6 | 5 | -11 | 0 | 3 | -9 | 6 | -11 | -6 | 5 | -7 | 0 | 209 | -326 | 7 | -6 | 1 | 33 | -350 |
| 1 | -6 | 6 | 8 | 9 | 3 | -8 | 0 | -10 | 4 | 5 | -7 | 1 | -1066 | 601 | 7 | -6 | 2 | 47 | -34 |
| 1 | -5 | -1 | 6 | 3 | 3 | -8 | 1 | 24 | 23 | 5 | -7 | 2 | 6323 | 172 | 7 | -6 | 3 | 14 | -9 |
| 1 | -5 | 0 | 100 | 28 | 3 | -8 | 2 | -168 | -168 | 5 | -7 | 3 | 572 | 2047 | 7 | -5 | -2 | 0 | -4 |
| 1 | -5 | 1 | -312 | -224 | 3 | -8 | 3 | -13 | 48 | 5 | -7 | 4 | -901 | -31 | 7 | -5 | -1 | 8 | -82 |
| 1 | -5 | 2 | 714 | 1741 | 3 | -8 | 4 | -33 | 31 | 5 | -7 | 5 | -56 | -54 | 7 | -5 | 0 | -46 | -124 |
| 1 | -5 | 3 | -379 | 424 | 3 | -8 | 5 | -27 | 7 | 5 | -7 | 6 | 12 | 11 | 7 | -5 | 1 | -88 | 204 |
| 1 | -5 | 4 | -19 | 23 | 3 | -8 | 6 | -5 | 5 | 5 | -7 | 7 | 11 | 17 | 7 | -5 | 2 | 13 | -46 |
| 1 | -5 | 5 | 13 | 2 | 3 | -8 | 7 | 4 | 3 | 5 | -7 | 8 | 2 | 0 | 7 | -5 | 3 | 1 | -9 |
| 1 | -5 | 6 | 11 | -2 | 3 | -7 | -1 | 3 | 2 | 5 | -6 | -2 | 6 | -1 | 7 | -4 | -2 | 2 | -2 |
| 1 | -4 | -2 | 1 | -3 | 3 | -7 | 0 | 62 | 35 | 5 | -6 | -1 | 88 | -36 | 7 | -4 | -1 | 315 | 149 |
| 1 | -4 | -1 | 31 | 29 | 3 | -7 | 1 | -144 | -231 | 5 | -6 | 0 | 1747 | -766 | 7 | -4 | 0 | -28 | -42 |
| 1 | -4 | 0 | 589 | 500 | 3 | -7 | 2 | 712 | 1499 | 5 | -6 | 1 | -5735 | 1646 | 7 | -4 | 1 | 86 | 318 |
| 1 | -4 | 1 | -1857 | -1764 | 3 | -7 | 3 | -23 | 287 | 5 | -6 | 2 | 14163 | 12284 | 7 | -4 | 2 | -10 | -2 |
| 1 | -4 | 2 | -1034 | 4750 | 3 | -7 | 4 | -72 | 106 | 5 | -6 | 3 | -3555 | 2751 | 7 | -3 | -3 | -4 | -9 |

Table 3 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -4 | 3 | -52 | 182 | 3 | -7 | 5 | 1 | 19 | 5 | -6 | 4 | -204 | -23 | 7 | -3 | -2 | -98 | -26 |
| 1 | -4 | 4 | 33 | 6 | 3 | -7 | 6 | 15 | 1 | 5 | -6 | 5 | 82 | 46 | 7 | -3 | -1 | -2446 | -277 |
| 1 | -4 | 5 | 21 | -10 | 3 | -6 | -1 | 13 | 8 | 5 | -6 | 6 | -1 | -2 | 7 | -3 | 0 | 352 | 48 |
| 1 | -3 | -2 | 6 | 11 | 3 | -6 | 0 | 191 | 177 | 5 | -6 | 7 | 9 | 3 | 7 | -3 | 1 | 64 | 224 |
| 1 | -3 | -1 | 63 | 227 | 3 | -6 | 1 | -498 | -657 | 5 | -5 | -3 | 3 | 1 | 7 | -3 | 2 | 3 | 18 |
| 1 | -3 | 0 | 1249 | 3759 | 3 | -6 | 2 | 693 | 2804 | 5 | -5 | -2 | 28 | 8 | 7 | -2 | -5 | -1 | 10 |
| 1 | -3 | 1 | -7327 | -14209 | 3 | -6 | 3 | 26 | 702 | 5 | -5 | -1 | 530 | 109 | 7 | -2 | -4 | -27 | 15 |
| 1 | -3 | 2 | -733 | -1175 | 3 | -6 | 4 | 40 | 10 | 5 | -5 | 0 | 10841 | 1170 | 7 | -2 | -3 | -271 | 146 |
| 1 | -3 | 3 | 94 | -263 | 3 | -6 | 5 | 17 | -8 | 5 | -5 | 1 | -38049 | -1021 | 7 | -2 | -2 | -3077 | 1368 |
| 1 | -3 | 4 | 7 | -16 | 3 | -6 | 6 | 8 | -10 | 5 | -5 | 2 | -18195 | 33415 | 7 | -2 | -1 | -57795 | 29986 |
| 1 | -3 | 5 | 2 | -5 | 3 | -5 | -2 | 2 | 4 | 5 | -5 | 3 | -1411 | 798 | 7 | -2 | 0 | 10126 | -5754 |
| 1 | -2 | -3 | -1 | -3 | 3 | -5 | -1 | 44 | 50 | 5 | -5 | 4 | 320 | -15 | 7 | -2 | 1 | 812 | -1338 |
| 1 | -2 | -2 | -5 | -51 | 3 | -5 | 0 | 716 | 981 | 5 | -5 | 5 | 44 | -3 | 7 | -2 | 2 | 53 | -59 |
| 1 | -2 | -1 | -44 | -957 | 3 | -5 | 1 | -2955 | -3090 | 5 | -5 | 6 | -3 | -1 | 7 | -2 | 3 | 3 | -4 |
| 1 | -2 | 0 | -2468 | -484 | 3 | -5 | 2 | 3132 | 4049 | 5 | -5 | 7 | 2 | -2 | 7 | -1 | -3 | -21 | 15 |
| 1 | -2 | 1 | -2174 | -4100 | 3 | -5 | 3 | 109 | -51 | 5 | -4 | -3 | -5 | 16 | 7 | -1 | -2 | 28 | -46 |
| 1 | -2 | 2 | -1912 | -1161 | 3 | -5 | 4 | 25 | -74 | 5 | -4 | -2 | -95 | 165 | 7 | -1 | -1 | -56 | 113 |
| 1 | -2 | 3 | -1 | -198 | 3 | -5 | 5 | 13 | -12 | 5 | -4 | -1 | -1389 | 3134 | 7 | -1 | 0 | 10 | -14 |
| 1 | -2 | 4 | 2 | -29 | 3 | -4 | -2 | 14 | -1 | 5 | -4 | 0 | 2487 | 45868 | 7 | -1 | 1 | 1 | -1 |
| 1 | -2 | 5 | 1 | -1 | 3 | -4 | -1 | 195 | -66 | 5 | -4 | 1 | -36728 | -171387 | 7 | 0 | -2 | -27 | -34 |
| 1 | -2 | 6 | -4 | 6 | 3 | -4 | 0 | 2728 | 589 | 5 | -4 | 2 | -7233 | -11661 | 7 | 0 | -1 | -6 | 23 |
| 1 | -1 | -4 | 7 | -1 | 3 | -4 | 1 | -14707 | -3189 | 5 | -4 | 3 | 649 | -2025 | 7 | 0 | 0 | 3 | -6 |
| 1 | -1 | -3 | 87 | -17 | 3 | -4 | 2 | -2327 | -1563 | 5 | -4 | 4 | 56 | -155 | 7 | 1 | -2 | -2 | -14 |
| 1 | -1 | -2 | 1220 | -168 | 3 | -4 | 3 | -201 | -362 | 5 | -4 | 5 | -7 | -1 | 7 | 3 | -2 | 5 | 1 |
| 1 | -1 | -1 | 27481 | -3365 | 3 | -4 | 4 | -13 | -13 | 5 | -4 | 6 | 3 | -4 | 7 | 3 | 0 | -5 | -1 |
| 1 | -1 | 0 | -6478 | -2823 | 3 | -4 | 5 | -2 | -5 | 5 | -3 | -4 | -4 | -8 | 8 | -10 | 0 | -1 | -18 |
| 1 | -1 | 1 | 16032 | 16337 | 3 | -3 | -3 | 6 | -2 | 5 | -3 | -3 | -62 | -118 | 8 | -10 | 1 | -10 | -6 |
| 1 | -1 | 2 | 722 | 652 | 3 | -3 | -2 | 34 | -42 | 5 | -3 | -2 | -681 | -1583 | 8 | -10 | 2 | 76 | 58 |
| 1 | -1 | 3 | 46 | 39 | 3 | -3 | -1 | 1086 | -338 | 5 | -3 | -1 | -13553 | -36220 | 8 | -10 | 3 | 4 | 3 |
| 1 | -1 | 4 | 3 | 6 | 3 | -3 | 0 | -6003 | 1411 | 5 | -3 | 0 | -20307 | -6908 | 8 | -9 | -1 | -2 | -0 |
| 1 | 0 | -4 | -5 | 2 | 3 | -3 | 1 | 11858 | 1319 | 5 | -3 | 1 | 40969 | -16940 | 8 | -9 | 0 | -51 | -10 |
| 1 | 0 | -3 | 9 | -31 | 3 | -3 | 2 | -601 | -849 | 5 | -3 | 2 | 2144 | -7241 | 8 | -9 | 1 | -3 | 14 |
| 1 | 0 | -2 | 207 | -493 | 3 | -3 | 3 | 27 | -11 | 5 | -3 | 3 | 160 | -364 | 8 | -9 | 2 | 72 | -88 |
| 1 | 0 | -1 | -3063 | -5533 | 3 | -3 | 4 | -7 | -8 | 5 | -3 | 4 | 13 | -48 | 8 | -9 | 3 | 3 | -4 |
| 1 | 0 | 0 | 393 | 1781 | 3 | -2 | -4 | 1 | -3 | 5 | -2 | -6 | -3 | -5 | 8 | -8 | -1 | 0 | -1 |
| 1 | 0 | 1 | 4390 | -3825 | 3 | -2 | -3 | 28 | -55 | 5 | -2 | -5 | -29 | -47 | 8 | -8 | 0 | 20 | -29 |
| 1 | 0 | 2 | 214 | -171 | 3 | -2 | -2 | 344 | -642 | 5 | -2 | -4 | -326 | -520 | 8 | -8 | 1 | -10 | 17 |
| 1 | 0 | 3 | 12 | -11 | 3 | -2 | -1 | 6467 | -13330 | 5 | -2 | -3 | -3872 | -6254 | 8 | -8 | 2 | 20 | 24 |
| 1 | 0 | 4 | 0 | -1 | 3 | -2 | 0 | 72 | 13370 | 5 | -2 | -2 | -55808 | -89984 | 8 | -8 | 3 | 0 | 1 |
| 1 | 1 | -5 | -3 | -1 | 3 | -2 | 1 | -58 | -62938 | 5 | -2 | -1 | -1184050 | -1925009 | 8 | -7 | -1 | -1 | 6 |
| 1 | 1 | -4 | 4 | 1 | 3 | -2 | 2 | -230 | -2700 | 5 | -2 | 0 | 175765 | 247369 | 8 | -7 | 0 | 11 | 8 |
| 1 | 1 | -3 | 22 | 28 | 3 | -2 | 3 | -37 | -270 | 5 | -2 | 1 | -62823 | 153228 | 8 | -7 | 1 | -23 | -14 |
| 1 | 1 | -2 | -124 | 1005 | 3 | -2 | 4 | -3 | -28 | 5 | -2 | 2 | -2912 | 7160 | 8 | -7 | 2 | 27 | 4 |
| 1 | 1 | -1 | -1871 | 6563 | 3 | -2 | 5 | 0 | -1 | 5 | -2 | 3 | -201 | 500 | 8 | -6 | -2 | -0 | -1 |
| 1 | 1 | 0 | 225 | -668 | 3 | -1 | -4 | -2 | -13 | 5 | -2 | 4 | -17 | 41 | 8 | -6 | -1 | -16 | -8 |
| 1 | 1 | 1 | 160 | 40 | 3 | -1 | -3 | -31 | -81 | 5 | -2 | 5 | -2 | 4 | 8 | -6 | 0 | -2 | -6 |
| 1 | 1 | 2 | 6 | 9 | 3 | -1 | -2 | -315 | -1470 | 5 | -1 | -5 | -5 | 4 | 8 | -6 | 1 | -13 | 37 |
| 1 | 2 | -5 | -4 | -3 | 3 | -1 | -1 | -5585 | -23656 | 5 | -1 | -4 | 21 | 44 | 8 | -6 | 2 | -6 | -1 |
| 1 | 2 | -4 | 57 | -4 | 3 | -1 | 0 | 2097 | 3473 | 5 | -1 | -3 | -115 | 322 | 8 | -5 | -2 | 2 | -1 |
| 1 | 2 | -3 | 41 | -11 | 3 | -1 | 1 | -3376 | -4018 | 5 | -1 | -2 | -1786 | 5680 | 8 | -5 | -1 | 35 | -15 |
| 1 | 2 | -2 | -17 | -1202 | 3 | -1 | 2 | -143 | -195 | 5 | -1 | -1 | 25239 | 12077 | 8 | -5 | 0 | -17 | 20 |
| 1 | 2 | -1 | -300 | 2429 | 3 | -1 | 3 | -13 | -12 | 5 | -1 | 0 | -21243 | -7395 | 8 | -5 | 1 | 58 | -79 |
| 1 | 2 | 0 | -63 | -589 | 3 | -1 | 4 | -1 | -1 | 5 | -1 | 1 | -7212 | 4624 | 8 | -5 | 2 | -1 | 4 |
| 1 | 2 | 1 | 7 | -49 | 3 | 0 | -4 | -3 | 1 | 5 | -1 | 2 | -369 | 172 | 8 | -4 | -2 | -4 | 1 |
| 1 | 2 | 2 | -0 | -3 | 3 | 0 | -3 | -5 | 8 | 5 | -1 | 3 | -26 | 15 | 8 | -4 | -1 | -83 | 21 |
| 1 | 3 | -5 | 11 | 2 | 3 | 0 | -2 | 154 | 523 | 5 | -1 | 4 | -3 | 6 | 8 | -4 | 0 | 21 | 12 |
| 1 | 3 | -4 | 4 | -24 | 3 | 0 | -1 | 239 | 5813 | 5 | 0 | -6 | -1 | 5 | 8 | -4 | 1 | -65 | -105 |
| 1 | 3 | -3 | -120 | -183 | 3 | 0 | 0 | 186 | -1396 | 5 | 0 | -5 | -1 | 1 | 8 | -4 | 2 | -3 | -5 |
| 1 | 3 | -2 | -199 | -598 | 3 | 0 | 1 | -7 | -256 | 5 | 0 | -4 | -60 | 149 | 8 | -3 | -2 | -17 | -13 |
| 1 | 3 | -1 | -69 | 324 | 3 | 0 | 2 | -4 | -13 | 5 | 0 | -3 | -748 | 1912 | 8 | -3 | -1 | -366 | -284 |
| 1 | 3 | 0 | 16 | -84 | 3 | 0 | 3 | 5 | -0 | 5 | 0 | -2 | -12744 | 4758 | 8 | -3 | 0 | 54 | 39 |
| 1 | 3 | 1 | 5 | -10 | 3 | 1 | -5 | -4 | -2 | 5 | 0 | -1 | -145988 | 68715 | 8 | -3 | 1 | -17 | 8 |
| 1 | 3 | 2 | -0 | -1 | 3 | 1 | -4 | 12 | -16 | 5 | 0 | 0 | 29994 | -18134 | 8 | -2 | -5 | 3 | -4 |

Table 3 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | -6 | 3 | -2 | 3 | 1 | -3 | 5 | -53 | 5 | 0 | 1 | 1835 | -1417 | 8 | -2 | -4 | 1 | 9 |
| 1 | 4 | -5 | -4 | -5 | 3 | 1 | -2 | -593 | -711 | 5 | 0 | 2 | 102 | -71 | 8 | -2 | -3 | -162 | -27 |
| 1 | 4 | -4 | -47 | -10 | 3 | 1 | -1 | -401 | -1372 | 5 | 0 | 3 | 12 | -1 | 8 | -2 | -2 | -2408 | -984 |
| 1 | 4 | -3 | -76 | -79 | 3 | 1 | 0 | 203 | 282 | 5 | 1 | -7 | 0 | 3 | 8 | -2 | -1 | -14094 | 4434 |
| 1 | 4 | -2 | -28 | -188 | 3 | 1 | 1 | 10 | 14 | 5 | 1 | -6 | -2 | -1 | 8 | -2 | 0 | 2743 | -965 |
| 1 | 4 | -1 | -8 | 36 | 3 | 2 | -5 | 7 | -0 | 5 | 1 | -5 | 47 | 24 | 8 | -2 | 1 | 233 | -196 |
| 1 | 4 | 0 | 4 | -8 | 3 | 2 | -4 | -10 | -9 | 5 | 1 | -4 | 263 | 272 | 8 | -2 | 2 | 18 | -6 |
| 1 | 5 | -6 | -4 | -5 | 3 | 2 | -3 | -111 | -14 | 5 | 1 | -3 | 128 | -915 | 8 | -1 | -1 | -5 | 6 |
| 1 | 5 | -5 | -9 | 2 | 3 | 2 | -2 | 461 | 11 | 5 | 1 | -2 | 13554 | -31683 | 8 | -1 | 1 | -5 | 6 |
| 1 | 5 | -4 | -17 | -16 | 3 | 2 | -1 | -30 | -271 | 5 | 1 | -1 | -23384 | 2431 | 9 | -10 | -1 | 4 | -9 |
| 1 | 5 | -3 | -33 | -5 | 3 | 2 | 0 | 9 | 76 | 5 | 1 | 0 | 6184 | -487 | 9 | -10 | 0 | 78 | -194 |
| 1 | 5 | -2 | 10 | -48 | 3 | 2 | 1 | 1 | 5 | 5 | 1 | 1 | 394 | -54 | 9 | -10 | 1 | -43 | -22 |
| 1 | 5 | -1 | -2 | 7 | 3 | 3 | -6 | 1 | -3 | 5 | 1 | 2 | 26 | -0 | 9 | -10 | 2 | 226 | 348 |
| 1 | 5 | 0 | 1 | -3 | 3 | 3 | -5 | -5 | 6 | 5 | 1 | 3 | 2 | -0 | 9 | -10 | 3 | 10 | 16 |
| 1 | 6 | -3 | -1 | 2 | 3 | 3 | -4 | -36 | 11 | 5 | 2 | -7 | 9 | 5 | 9 | -9 | 0 | -4 | -13 |
| 1 | 6 | -2 | -12 | 53 | 3 | 3 | -3 | 51 | -33 | 5 | 2 | -6 | 2 | -7 | 9 | -9 | 1 | -1 | 4 |
| 1 | 6 | -1 | 2 | -8 | 3 | 3 | -2 | 96 | 125 | 5 | 2 | -5 | 106 | 26 | 9 | -9 | 2 | 9 | -14 |
| 1 | 6 | 0 | -0 | 1 | 3 | 3 | -1 | 9 | -40 | 5 | 2 | -4 | -43 | -145 | 9 | -6 | -1 | -0 | -7 |
| 2 | -9 | 2 | 4 | -2 | 3 | 3 | 0 | -5 | 9 | 5 | 2 | -3 | -604 | -4722 | 9 | -6 | 0 | -2 | 1 |
| 2 | -9 | 3 | 9 | -7 | 3 | 4 | -6 | 5 | 2 | 5 | 2 | -2 | 9838 | -6497 | 9 | -6 | 1 | 16 | 4 |
| 2 | -9 | 4 | -14 | -13 | 3 | 4 | -5 | -14 | 19 | 5 | 2 | -1 | -2843 | -202 | 9 | -5 | -2 | 1 | 0 |
| 2 | -9 | 5 | 7 | -25 | 3 | 4 | -4 | -20 | -18 | 5 | 2 | 0 | 715 | 256 | 9 | -5 | -1 | 29 | -3 |
| 2 | -9 | 6 | 17 | -4 | 3 | 4 | -3 | 16 | 36 | 5 | 2 | 1 | 44 | 11 | 9 | -5 | 0 | -6 | -0 |
| 2 | -9 | 7 | 3 | -0 | 3 | 4 | -2 | -11 | 56 | 5 | 2 | 2 | 3 | -0 | 9 | -5 | 1 | 17 | 3 |
| 2 | -9 | 8 | -2 | -3 | 3 | 4 | -1 | 2 | -8 | 5 | 3 | -8 | 1 | -1 | 9 | -5 | 2 | 1 | 0 |
| 2 | -8 | 0 | 1 | -2 | 3 | 4 | 0 | -1 | 2 | 5 | 3 | -7 | 17 | -13 | 9 | -4 | -2 | -5 | 7 |
| 2 | -8 | 1 | -8 | 20 | 3 | 5 | -4 | 2 | -5 | 5 | 3 | -6 | 28 | -9 | 9 | -4 | -1 | -99 | 140 |
| 2 | -8 | 2 | 59 | -134 | 3 | 5 | -3 | -2 | 2 | 5 | 3 | -5 | -45 | -11 | 9 | -4 | 0 | 15 | -29 |
| 2 | -8 | 3 | -93 | 4 | 3 | 5 | -2 | -40 | 48 | 5 | 3 | -4 | -683 | -646 | 9 | -4 | 1 | -7 | 65 |
| 2 | -8 | 4 | -37 | -101 | 3 | 5 | -1 | 6 | -8 | 5 | 3 | -3 | 624 | -1345 | 9 | -4 | 2 | -0 | 3 |
| 2 | -8 | 5 | 45 | -91 | 4 | -9 | 1 | 5 | 0 | 5 | 3 | -2 | 2895 | -84 | 9 | -3 | -2 | -2 | 3 |
| 2 | -8 | 6 | 21 | -22 | 4 | -9 | 2 | -26 | 2 | 5 | 3 | -1 | -455 | -98 | 9 | -3 | -1 | -35 | 61 |
| 2 | -8 | 7 | -11 | -2 | 4 | -9 | 3 | 14 | 17 | 5 | 3 | 0 | 64 | 57 | 9 | -3 | 0 | 5 | -9 |
| 2 | -7 | -1 | -0 | 11 | 4 | -9 | 4 | -12 | 12 | 5 | 3 | 1 | 5 | 3 | 9 | -3 | 1 | -2 | 4 |
| 2 | -7 | 0 | -7 | 242 | 4 | -8 | -1 | -6 | 1 | 5 | 4 | -9 | 3 | -5 | 9 | -2 | -4 | -1 | 14 |
| 2 | -7 | 1 | 1151 | -1113 | 4 | -8 | 0 | -120 | 28 | 5 | 4 | -8 | 4 | -4 | 9 | -2 | -3 | -76 | 152 |
| 2 | -7 | 2 | -8273 | 7574 | 4 | -8 | 1 | 385 | 307 | 5 | 4 | -7 | 3 | -2 | 9 | -2 | -2 | -786 | -711 |
| 2 | -7 | 3 | -898 | 144 | 4 | -8 | 2 | -2651 | -2194 | 5 | 4 | -6 | -16 | -5 | 9 | -2 | -1 | -2322 | 294 |
| 2 | -7 | 4 | -48 | -335 | 4 | -8 | 3 | -177 | -25 | 5 | 4 | -5 | -216 | -19 | 9 | -2 | 0 | 505 | -77 |
| 2 | -7 | 5 | 7 | -39 | 4 | -8 | 4 | -30 | -29 | 5 | 4 | -4 | -80 | -306 | 9 | -2 | 1 | 45 | -25 |
| 2 | -7 | 6 | -22 | -3 | 4 | -8 | 5 | -1 | -6 | 5 | 4 | -3 | 265 | -130 | 9 | -2 | 2 | 3 | -1 |
| 2 | -7 | 7 | -9 | 4 | 4 | -8 | 6 | 9 | 11 | 5 | 4 | -2 | 1203 | 628 | 10 | -10 | -1 | -0 | 1 |
| 2 | -6 | -2 | -0 | 1 | 4 | -7 | -1 | 6 | 1 | 5 | 4 | -1 | -170 | -89 | 10 | -10 | 0 | -21 | 14 |
| 2 | -6 | -1 | -8 | 21 | 4 | -7 | 0 | 119 | 22 | 5 | 4 | 0 | 10 | 14 | 10 | -10 | 1 | 5 | 2 |
| 2 | -6 | 0 | -152 | 347 | 4 | -7 | 1 | -208 | -191 | 5 | 5 | -8 | -0 | -10 | 10 | -10 | 2 | -16 | -31 |
| 2 | -6 | 1 | 1200 | -768 | 4 | -7 | 2 | 388 | 1413 | 5 | 5 | -7 | -17 | 10 | 10 | -10 | 3 | 0 | -1 |
| 2 | -6 | 2 | -8157 | 1907 | 4 | -7 | 3 | -121 | 83 | 5 | 5 | -6 | -47 | 23 | 10 | -9 | 0 | -2 | -7 |
| 2 | -6 | 3 | -1464 | -1403 | 4 | -7 | 4 | -30 | 1 | 5 | 5 | -5 | -65 | -50 | 10 | -9 | 2 | 2 | 7 |
| 2 | -6 | 4 | -91 | -167 | 4 | -7 | 5 | 0 | 11 | 5 | 5 | -4 | 19 | -53 | 10 | -8 | 0 | 13 | 5 |
| 2 | -6 | 5 | -28 | 18 | 4 | -7 | 6 | 11 | -4 | 5 | 5 | -3 | 36 | -1 | 10 | -8 | 1 | -6 | 4 |
| 2 | -6 | 6 | -19 | 33 | 4 | -6 | -2 | 1 | 1 | 5 | 5 | -2 | -31 | -40 | 10 | -8 | 2 | 29 | -31 |
| 2 | -6 | 7 | -1 | 1 | 4 | -6 | -1 | 15 | 13 | 5 | 5 | -1 | 4 | 6 | 10 | -7 | -1 | -6 | -7 |
| 2 | -5 | -2 | -3 | 10 | 4 | -6 | 0 | 289 | 279 | 5 | 6 | -9 | -5 | 5 | 10 | -7 | 0 | 5 | -21 |
| 2 | -5 | -1 | -106 | 79 | 4 | -6 | 1 | -640 | -616 | 5 | 6 | -8 | -10 | 3 | 10 | -7 | 1 | -12 | 76 |
| 2 | -5 | 0 | -1832 | 1562 | 4 | -6 | 2 | -1458 | 939 | 5 | 6 | -7 | -7 | 22 | 10 | -7 | 2 | 37 | 67 |
| 2 | -5 | 1 | 6133 | -3781 | 4 | -6 | 3 | -100 | 102 | 5 | 6 | -6 | -33 | 1 | 10 | -7 | 3 | 3 | 15 |
| 2 | -5 | 2 | -18941 | -5947 | 4 | -6 | 4 | 27 | 18 | 5 | 6 | -5 | -8 | -18 | 10 | -6 | -1 | 1 | -2 |
| 2 | -5 | 3 | -1121 | -646 | 4 | -6 | 5 | 10 | 0 | 5 | 6 | -4 | -5 | 8 | 10 | -6 | 0 | 57 | 32 |
| 2 | -5 | 4 | -7 | 164 | 4 | -5 | -2 | -4 | 3 | 5 | 6 | -3 | -0 | -2 | 10 | -6 | 1 | -244 | -96 |
| 2 | -5 | 5 | -1 | 23 | 4 | -5 | -1 | -52 | 30 | 6 | -10 | 0 | -5 | 1 | 10 | -6 | 2 | -18 | 8 |
| 2 | -5 | 6 | 6 | 21 | 4 | -5 | 0 | -713 | 1027 | 6 | -10 | 1 | -0 | -2 | 10 | -6 | 3 | -2 | -4 |
| 2 | -4 | -3 | -3 | -0 | 4 | -5 | 1 | 873 | -3004 | 6 | -10 | 2 | 5 | 14 | 10 | -5 | -2 | -5 | -6 |
| 2 | -4 | -2 | -38 | 7 | 4 | -5 | 2 | 224 | 164 | 6 | -9 | -1 | 2 | 1 | 10 | -5 | -1 | -87 | -1 |

Table 3 (Cont.)

| 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin | 6 | 5 | 4 | cos | sin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | -4 | -1 | -644 | 81 | 4 | -5 | 3 | 82 | -38 | 6 | -9 | 0 | 34 | 23 | 10 | -5 | 0 | -18 | 23 |
| 2 | -4 | 0 | -11570 | 2584 | 4 | -5 | 4 | 33 | -22 | 6 | -9 | 1 | 1 | -64 | 10 | -5 | 1 | -20 | -98 |
| 2 | -4 | 1 | 39007 | -15588 | 4 | -5 | 5 | 1 | -1 | 6 | -9 | 2 | -35 | 441 | 10 | -5 | 2 | -13 | -14 |
| 2 | -4 | 2 | -639 | -2141 | 4 | -4 | -3 | 0 | -1 | 6 | -9 | 3 | 8 | 33 | 10 | -4 | -3 | -16 | 5 |
| 2 | -4 | 3 | 805 | 410 | 4 | -4 | -2 | 8 | -31 | 6 | -8 | -1 | -1 | -4 | 10 | -4 | -2 | -233 | 55 |
| 2 | -4 | 4 | 92 | 74 | 4 | -4 | -1 | 173 | -518 | 6 | -8 | 0 | -32 | -73 | 10 | -4 | -1 | -4936 | 1391 |
| 2 | -4 | 5 | 25 | 13 | 4 | -4 | 0 | 32 | -827 | 6 | -8 | 1 | -13 | 58 | 10 | -4 | 0 | 655 | -206 |
| 2 | -3 | -3 | 9 | 0 | 4 | -4 | 1 | -1652 | -328 | 6 | -8 | 2 | 379 | 104 | 10 | -4 | 1 | 171 | 135 |
| 2 | -3 | -2 | 99 | -36 | 4 | -4 | 2 | 102 | -491 | 6 | -8 | 3 | 13 | 9 | 10 | -4 | 2 | 15 | 6 |
| 2 | -3 | -1 | 1959 | -308 | 4 | -4 | 3 | 18 | -65 | 6 | -8 | 4 | -1 | -3 | 10 | -3 | -2 | 12 | 18 |
| 2 | -3 | 0 | 2565 | -9058 | 4 | -4 | 4 | 2 | -11 | 6 | -7 | -1 | 7 | -1 | 10 | -3 | -1 | 28 | -20 |
| 2 | -3 | 1 | 14097 | -7115 | 4 | -3 | -3 | 5 | -1 | 6 | -7 | 0 | 141 | -33 | 10 | -3 | 0 | -27 | 31 |
| 2 | -3 | 2 | 6933 | -977 | 4 | -3 | -2 | 73 | -2 | 6 | -7 | 1 | -157 | 63 | 10 | -3 | 1 | 20 | 7 |
| 2 | -3 | 3 | 592 | 42 | 4 | -3 | -1 | 1970 | 1120 | 6 | -7 | 2 | -33 | 258 | 10 | -3 | 2 | 1 | -0 |
| 2 | -3 | 4 | 30 | 6 | 4 | -3 | 0 | -668 | -656 | 6 | -7 | 3 | -3 | 39 | 10 | -2 | -5 | 5 | -3 |
| 2 | -3 | 5 | 9 | 1 | 4 | -3 | 1 | 1263 | 3488 | 6 | -7 | 4 | 4 | -0 | 10 | -2 | -4 | 23 | 5 |
| 2 | -2 | -4 | 2 | 7 | 4 | -3 | 2 | 3 | 27 | 6 | -6 | -2 | -2 | 2 | 10 | -2 | -3 | -36 | 76 |
| 2 | -2 | -3 | 29 | 95 | 4 | -3 | 3 | 1 | -1 | 6 | -6 | -1 | -34 | 39 | 10 | -2 | -2 | -160 | -208 |
| 2 | -2 | -2 | 408 | 1390 | 4 | -2 | -4 | -7 | 0 | 6 | -6 | 0 | 27 | 183 | 10 | -2 | -1 | -309 | 194 |
| 2 | -2 | -1 | 6935 | 33572 | 4 | -2 | -3 | -97 | -13 | 6 | -6 | 1 | -182 | -326 | 10 | -2 | 0 | 69 | -20 |
| 2 | -2 | 0 | 11151 | -6951 | 4 | -2 | -2 | -1226 | -9 | 6 | -6 | 2 | 40 | -2 | 10 | -2 | 1 | 15 | -2 |
| 2 | -2 | 1 | -53845 | 6331 | 4 | -2 | -1 | -30134 | -121 | 6 | -6 | 3 | 11 | -13 | 10 | -1 | -3 | -1 | -1 |
| 2 | -2 | 2 | -3566 | -35 | 4 | -2 | 0 | 6536 | 1177 | 6 | -6 | 4 | 1 | -3 | 10 | -1 | -2 | -41 | -43 |
| 2 | -2 | 3 | -277 | -58 | 4 | -2 | 1 | -24078 | 2101 | 6 | -5 | -2 | -1 | -1 | 10 | -1 | -1 | 0 | 20 |
| 2 | -2 | 4 | 4 | -7 | 4 | -2 | 2 | -1573 | 428 | 6 | -5 | -1 | -65 | -89 | 10 | -1 | 0 | 1 | -5 |
| 2 | -2 | 5 | 2 | 0 | 4 | -2 | 3 | -106 | 9 | 6 | -5 | 0 | -92 | -88 | 10 | -1 | 1 | -1 | -1 |
| 2 | -1 | -4 | 21 | 12 | 4 | -2 | 4 | -4 | 6 | 6 | -5 | 1 | -113 | 133 | 10 | 0 | -2 | -4 | -17 |
| 2 | -1 | -3 | 45 | 167 | 4 | -1 | -4 | 2 | -10 | 6 | -5 | 2 | -68 | -71 | 10 | 0 | -1 | 1 | 3 |
| 2 | -1 | -2 | 901 | 2776 | 4 | -1 | -3 | -35 | -33 | 6 | -5 | 3 | -9 | -14 | 10 | 0 | 0 | -1 | -6 |
| 2 | -1 | -1 | 559 | 43952 | 4 | -1 | -2 | -557 | -245 | 6 | -5 | 4 | -1 | 0 | 11 | -4 | -1 | -9 | 31 |
| 2 | -1 | 0 | 4669 | 119 | 4 | -1 | -1 | -6527 | -4580 | 6 | -4 | -3 | 1 | -0 | 11 | -4 | 0 | 4 | -5 |
| 2 | -1 | 1 | -35956 | -8120 | 4 | -1 | 0 | 1108 | 876 | 6 | -4 | -2 | 2 | -10 | 11 | -4 | 1 | -22 | 4 |
| 2 | -1 | 2 | -1705 | -379 | 4 | -1 | 1 | 303 | -59 | 6 | -4 | -1 | 263 | -48 | 11 | -2 | -5 | -1 | -4 |
| 2 | -1 | 3 | -114 | -22 | 4 | -1 | 2 | 7 | -0 | 6 | -4 | 0 | -136 | 24 | 11 | -2 | -4 | 30 | 2 |
| 2 | -1 | 4 | -10 | -2 | 4 | 0 | -5 | -1 | 0 | 6 | -4 | 1 | 494 | 68 | 11 | -2 | -3 | -25 | 15 |
| 2 | 0 | -4 | 8 | 12 | 4 | 0 | -4 | -2 | 11 | 6 | -4 | 2 | -6 | -15 | 11 | -2 | -2 | -15 | -58 |
| 2 | 0 | -3 | 104 | -9 | 4 | 0 | -3 | -42 | 33 | 6 | -4 | 3 | 3 | 4 | 11 | -2 | -1 | -37 | -9 |
| 2 | 0 | -2 | -130 | -127 | 4 | 0 | -2 | -30 | 94 | 6 | -4 | 4 | 1 | 0 | 11 | -2 | 0 | 10 | 2 |
| 2 | 0 | -1 | 2484 | -5705 | 4 | 0 | -1 | -987 | 1635 | 6 | -3 | -3 | -8 | -4 | 12 | -5 | -1 | -10 | 24 |
| 2 | 0 | 0 | -1202 | 293 | 4 | 0 | 0 | 186 | -348 | 6 | -3 | -2 | -9 | -22 | 12 | -5 | 0 | 1 | -3 |
| 2 | 0 | 1 | -317 | 252 | 4 | 0 | 1 | 4 | -18 | 6 | -3 | -1 | -447 | -242 | 12 | -4 | -2 | 0 | 4 |
| 2 | 0 | 2 | -18 | 15 | 4 | 1 | -5 | 3 | -6 | 6 | -3 | 0 | 79 | 20 | 12 | -4 | -1 | 7 | 83 |
| 2 | 0 | 3 | -1 | 1 | 4 | 1 | -4 | 12 | -2 | 6 | -3 | 1 | 467 | -148 | 12 | -4 | 0 | -1 | -11 |
| 2 | 1 | -6 | -10 | 1 | 4 | 1 | -3 | 18 | -21 | 6 | -3 | 2 | 27 | 4 | 12 | -4 | 1 | -1 | -5 |
| 2 | 1 | -5 | -5 | -4 | 4 | 1 | -2 | -30 | -297 | 6 | -3 | 3 | 3 | -0 | 13 | -4 | -1 | 0 | 11 |
| 2 | 1 | -4 | 14 | -8 | 4 | 1 | -1 | -213 | 143 | 6 | -2 | -4 | -1 | -4 | 15 | -6 | -1 | -6 | 10 |
| 2 | 1 | -3 | -101 | 52 | 4 | 1 | 0 | 49 | -31 | 6 | -2 | -3 | -42 | -15 | 15 | -6 | 1 | 6 | -10 |

Table 4. Fourier representation of $\delta x_2$ (mixed part)

T measured from epoch in days.
The coefficients are in units of $10^{-19}$.
The argument is $k\ell_4$, $\ell_4$ mean anomaly of Mars.

| k | cos | sin |
|---|---|---|
| 1 | 0 $T^2$ | -26 $T^2$ |
| 2 | 0 $T^2$ | -2 $T^2$ |
| 0 | 313774 T | 0 T |
| 1 | 10849 T | -78999480 T |
| 2 | -102779 T | -8840577 T |
| 3 | -14383 T | -977485 T |
| 4 | -1786 T | -110676 T |
| 5 | -217 T | -12768 T |
| 6 | -26 T | -1493 T |
| 7 | -3 T | -176 T |
| 8 | 0 T | -21 T |
| 9 | 0 T | -3 T |

Table 5. Fourier representation of $\delta y_2$ (mixed part)

T measured from epoch in days.
The coefficients are in units of $10^{-19}$.
The argument is $k\ell_4$, $\ell_4$ mean anomaly of Mars.

| k | cos | sin |
|---|---|---|
| 1 | 26 $T^2$ | 0 $T^2$ |
| 2 | 2 $T^2$ | 0 $T^2$ |
| 0 | 4512938 T | 0 T |
| 1 | 78686060 T | 20653 T |
| 2 | 8823289 T | -102322 T |
| 3 | 976183 T | -14351 T |
| 4 | 110563 T | -1784 T |
| 5 | 12758 T | -216 T |
| 6 | 1492 T | -26 T |
| 7 | 176 T | -3 T |
| 8 | 21 T | 0 T |
| 9 | 3 T | 0 T |

Table 6. Fourier representation of $\delta z_2$ (mixed part)

T measured from epoch in days.
The coefficients are in units of $10^{-19}$.
The argument is $k\ell_4$, $\ell_4$ mean anomaly of Mars.

| k | cos | sin |
|---|---|---|
| 0 | 658698 T | 0 T |
| 1 | -4692988 T | 873448 T |
| 2 | -218295 T | 40658 T |
| 3 | -15234 T | 2838 T |
| 4 | -1260 T | 235 T |
| 5 | -115 T | 21 T |
| 6 | -11 T | 2 T |
| 7 | -1 T | 0 T |

Table 7. Comparison of numerical integration with the analytical solution. The values are expressed in units of $10^{10}$

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|
| 120 | 5261 | -0 | 41426 | 4 | 2731 | -4 |
| 160 | -1332 | -1 | 41088 | 3 | 2469 | -4 |
| 200 | -4919 | -2 | 36168 | 1 | 1988 | -4 |
| 240 | -4118 | -1 | 28429 | 1 | 1329 | -3 |
| 280 | 910 | -1 | 20876 | 0 | 546 | -2 |
| 320 | 8058 | -3 | 16375 | 1 | -286 | -1 |
| 360 | 13981 | -2 | 15724 | -1 | -1070 | -0 |
| 400 | 16080 | -1 | 16799 | -2 | -1691 | 1 |
| 440 | 14862 | -2 | 15896 | -3 | -2040 | 2 |
| 480 | 14249 | -1 | 11156 | -2 | -2043 | 3 |
| 520 | 18329 | 1 | 5014 | -2 | -1693 | 4 |
| 560 | 27357 | 3 | 2379 | -2 | -1057 | 3 |
| 600 | 37508 | 4 | 6372 | -1 | -254 | 2 |
| 640 | 44077 | 2 | 16291 | -0 | 586 | 1 |
| 680 | 44331 | 2 | 28243 | 1 | 1349 | -0 |
| 720 | 38156 | 0 | 40354 | 1 | 1948 | -2 |
| 760 | 27264 | 1 | 48187 | -1 | 2327 | -3 |
| 800 | 14139 | 1 | 51130 | 0 | 2455 | -3 |
| 840 | 1325 | -1 | 49225 | 1 | 2323 | -3 |
| 880 | -8907 | -2 | 43456 | 2 | 1942 | -4 |
| 920 | -14685 | -1 | 35536 | 2 | 1347 | -4 |
| 960 | -14754 | -1 | 27811 | 0 | 593 | -3 |
| 1000 | -9171 | -1 | 23032 | -2 | -230 | -2 |
| 1040 | -358 | -1 | 23482 | -1 | -1002 | -1 |
| 1080 | 6917 | -2 | 29163 | -2 | -1595 | 1 |
| 1120 | 8412 | -0 | 36273 | -2 | -1601 | 2 |
| 1160 | 4689 | 0 | 38975 | -1 | -1859 | 2 |
| 1200 | 1555 | 0 | 34703 | -3 | -1479 | 3 |
| 1240 | 4649 | 1 | 27197 | -1 | -838 | 3 |
| 1280 | 14137 | -0 | 23020 | -0 | -58 | 2 |
| 1320 | 25254 | 2 | 25938 | -1 | 735 | 1 |
| 1360 | 32515 | 3 | 34957 | 0 | 1435 | -0 |
| 1400 | 32905 | 2 | 46097 | 2 | 1966 | -1 |
| 1440 | 26520 | 0 | 55012 | 1 | 2283 | -2 |
| 1480 | 15652 | -1 | 58711 | 0 | 2362 | -3 |
| 1520 | 3459 | -1 | 56167 | 1 | 2200 | -4 |
| 1560 | -7162 | -1 | 48150 | 0 | 1812 | -4 |
| 1600 | -14332 | -3 | 36658 | 3 | 1229 | -4 |
| 1640 | -17506 | -2 | 24156 | 2 | 499 | -3 |
| 1680 | -17336 | -3 | 12836 | 3 | -310 | -2 |
| 1720 | -15088 | -4 | 4170 | -1 | -1110 | -1 |
| 1760 | -11917 | 1 | -1022 | -0 | -1792 | 1 |
| 1800 | -8596 | -0 | -2327 | 0 | -2236 | 2 |
| 1840 | -5757 | -0 | -297 | -4 | -2327 | 2 |
| 1880 | -3467 | 2 | 3012 | -4 | -2012 | 3 |
| 1920 | -400 | 4 | 5848 | 1 | -1337 | 3 |
| 1960 | 4934 | 3 | 8945 | -1 | -431 | 3 |
| 2000 | 11983 | 3 | 14515 | -1 | 552 | 2 |
| 2040 | 18166 | 2 | 23587 | -1 | 1471 | 1 |
| 2080 | 20747 | 2 | 34837 | 1 | 2223 | -1 |
| 2120 | 18510 | 3 | 45326 | 3 | 2740 | -1 |
| 2160 | 12298 | 3 | 51969 | 5 | 2985 | -2 |
| 2200 | 4602 | -0 | 52811 | 2 | 2944 | -3 |
| 2240 | -1369 | -1 | 47753 | 1 | 2626 | -3 |
| 2280 | -2849 | -0 | 38688 | -1 | 2056 | -3 |
| 2320 | 1338 | 0 | 28999 | 0 | 1284 | -3 |
| 2360 | 9919 | -1 | 22351 | 1 | 380 | -2 |
| 2400 | 19167 | -3 | 20814 | -1 | -556 | -1 |
| 2440 | 24644 | -1 | 23012 | -1 | -1402 | 0 |
| 2480 | 24326 | -1 | 24096 | -3 | -2024 | 2 |
| 2520 | 21342 | 1 | 19348 | -4 | -2310 | 3 |
| 2560 | 21678 | 1 | 9451 | 2 | -2206 | 3 |
| 13440 | 7624 | -0 | 18754 | 0 | -915 | -0 |
| 13480 | 9230 | -1 | 21069 | -1 | -1595 | -1 |
| 13520 | 7737 | -1 | 20713 | 1 | -2004 | -1 |
| 13560 | 7229 | 0 | 16678 | -0 | -2063 | -1 |
| 13600 | 10830 | -1 | 11929 | 1 | -1769 | -1 |
| 13640 | 17850 | 1 | 10615 | 1 | -1191 | -1 |
| 13680 | 24829 | -1 | 14645 | 1 | -441 | -0 |
| 13720 | 28364 | 1 | 22979 | 0 | 360 | 0 |
| 13760 | 26793 | -0 | 32995 | 1 | 1106 | 0 |
| 13800 | 20261 | 1 | 41977 | -1 | 1716 | 1 |
| 13840 | 10116 | 2 | 47878 | -0 | 2133 | 1 |
| 13880 | -1680 | -0 | 49542 | 2 | 2322 | 1 |
| 13920 | -12909 | -0 | 46732 | 2 | 2265 | 1 |
| 13960 | -21333 | -2 | 40174 | 2 | 1964 | 1 |
| 14000 | -24991 | -1 | 31625 | -0 | 1440 | 1 |
| 14040 | -22789 | 0 | 23832 | 1 | 741 | 0 |
| 14080 | -15515 | -0 | 19990 | 1 | -50 | -0 |
| 14120 | -6680 | -0 | 22209 | 0 | -819 | -1 |
| 14160 | -1435 | -0 | 29329 | 1 | -1439 | -1 |
| 14200 | -2756 | -0 | 36319 | 0 | -1797 | -1 |
| 14240 | -8155 | -1 | 37744 | -1 | -1825 | -1 |
| 14280 | -11568 | -1 | 32805 | 0 | -1524 | -1 |
| 14320 | -9027 | -2 | 25933 | 0 | -964 | -1 |
| 14360 | -1599 | -0 | 22452 | 1 | -253 | -1 |
| 14400 | 6532 | -1 | 24697 | 1 | 495 | 0 |
| 14440 | 11360 | 0 | 31557 | 0 | 1178 | 0 |
| 14480 | 10858 | 1 | 40076 | 1 | 1721 | 1 |
| 14520 | 5144 | 1 | 47125 | -1 | 2070 | 2 |
| 14560 | -4147 | 0 | 50383 | -1 | 2197 | 2 |
| 14600 | -14593 | 1 | 48729 | -0 | 2091 | 2 |
| 14640 | -23625 | 1 | 42319 | 1 | 1759 | 2 |
| 14680 | -29078 | 0 | 32525 | -0 | 1228 | 1 |
| 14720 | -29718 | 2 | 21739 | -1 | 546 | 1 |
| 14760 | -25734 | 3 | 12928 | 1 | -219 | 0 |
| 14800 | -19029 | -0 | 8808 | 1 | -970 | -0 |
| 14840 | -12909 | 1 | 10565 | 2 | -1590 | -1 |
| 14880 | -10613 | -0 | 16497 | 1 | -1959 | -1 |
| 14920 | -12802 | 0 | 22127 | 1 | -1984 | -1 |
| 14960 | -16209 | 2 | 23535 | 1 | -1651 | -1 |
| 15000 | -16208 | -0 | 21168 | 1 | -1026 | -1 |
| 15040 | -11093 | -3 | 19096 | 1 | -228 | -1 |
| 15080 | -3160 | 4 | 20976 | -0 | 614 | -0 |
| 15120 | 3601 | -1 | 27492 | 0 | 1387 | 0 |
| 15160 | 6123 | -0 | 36595 | -1 | 2008 | 1 |
| 15200 | 3451 | -1 | 45069 | -0 | 2417 | 2 |
| 15240 | -3318 | -0 | 50010 | 1 | 2581 | 2 |
| 15280 | -11717 | 0 | 49750 | 1 | 2488 | 2 |
| 15320 | -18785 | -1 | 44250 | 1 | 2143 | 2 |
| 15360 | -21974 | -1 | 35091 | -1 | 1575 | 2 |
| 15400 | -20035 | -1 | 25064 | 0 | 833 | 1 |
| 15440 | -13707 | 1 | 17254 | -0 | -5 | 1 |
| 15480 | -5731 | -1 | 13576 | 0 | -835 | -0 |
| 15520 | 467 | -1 | 13374 | -1 | -1534 | -1 |
| 15560 | 3230 | 1 | 13613 | 2 | -1979 | -2 |
| 15600 | 4076 | -1 | 11618 | -0 | -2085 | -2 |
| 15640 | 5737 | -1 | 7978 | -2 | -1839 | -2 |
| 15680 | 9060 | 0 | 5862 | -1 | -1310 | -1 |
| 15720 | 12905 | -1 | 7883 | 0 | -616 | -1 |
| 15760 | 15766 | -1 | 14675 | -0 | 119 | -0 |
| 15800 | 16207 | -0 | 25468 | -0 | 798 | 0 |
| 15840 | 12823 | 0 | 38609 | -2 | 1356 | 1 |
| 15880 | 4671 | 1 | 51707 | 0 | 1749 | 1 |
| 26760 | 20949 | -0 | 21369 | 0 | -342 | -0 |
| 26800 | 22751 | 1 | 29497 | -1 | 447 | 2 |
| 26840 | 19404 | 1 | 37994 | 1 | 1179 | 4 |
| 26880 | 11634 | 1 | 44340 | 0 | 1777 | 6 |
| 26920 | 1127 | 1 | 46970 | 2 | 2184 | 7 |
| 26960 | -10053 | 1 | 45359 | 1 | 2360 | 8 |
| 27000 | -19805 | 1 | 39931 | -1 | 2281 | 8 |
| 27040 | -26176 | 1 | 31990 | -1 | 1941 | 7 |
| 27080 | -27599 | -0 | 23734 | -1 | 1359 | 5 |
| 27120 | -23559 | 2 | 18159 | 0 | 590 | 2 |
| 27160 | -15816 | 1 | 18276 | 1 | -268 | -1 |
| 27200 | -8998 | 1 | 25088 | 1 | -1080 | -3 |
| 27240 | -8323 | 1 | 35348 | 2 | -1702 | -5 |
| 27280 | -14873 | -1 | 42411 | 0 | -2014 | -6 |
| 27320 | -23658 | -1 | 41466 | 0 | -1962 | -6 |
| 27360 | -27901 | -1 | 33862 | 2 | -1569 | -6 |
| 27400 | -24785 | -2 | 25347 | -1 | -919 | -4 |
| 27440 | -16573 | -1 | 21022 | -1 | -128 | -2 |
| 27480 | -7760 | -0 | 22446 | -1 | 688 | 1 |
| 27520 | -2046 | 1 | 27975 | 1 | 1431 | 4 |
| 27560 | -987 | 0 | 34485 | 2 | 2026 | 6 |
| 27600 | -4015 | 1 | 38968 | 1 | 2417 | 7 |
| 27640 | -9128 | -1 | 39527 | -0 | 2569 | 8 |
| 27680 | -13770 | 2 | 35808 | -1 | 2446 | 8 |
| 27720 | -15708 | 1 | 29015 | -1 | 2103 | 7 |
| 27760 | -13833 | 2 | 21528 | 1 | 1507 | 6 |
| 27800 | -8736 | -1 | 16105 | -1 | 724 | 4 |
| 27840 | -2743 | 4 | 14715 | 3 | -167 | 1 |
| 27880 | 948 | -2 | 17406 | -1 | -1054 | -2 |
| 27920 | 18 | 0 | 21988 | 1 | -1799 | -5 |
| 27960 | -5288 | 1 | 25130 | 1 | -2262 | -6 |
| 28000 | -12039 | -1 | 24449 | 2 | -2348 | -6 |
| 28040 | -16504 | -3 | 20212 | 0 | -2041 | -5 |
| 28080 | -16634 | -1 | 15065 | -1 | -1408 | -4 |
| 28120 | -13052 | -2 | 11993 | 0 | -568 | -2 |
| 28160 | -8108 | -1 | 12500 | -1 | 353 | 1 |
| 28200 | -4286 | -1 | 16200 | -2 | 1236 | 3 |
| 28240 | -3125 | -0 | 21432 | -1 | 1988 | 5 |
| 28280 | -4858 | -1 | 26136 | 0 | 2536 | 7 |
| 28320 | -8541 | 1 | 28508 | 0 | 2831 | 8 |
| 28360 | -12441 | -0 | 27976 | 0 | 2842 | 8 |
| 28400 | -14595 | 1 | 24616 | -1 | 2561 | 7 |
| 28440 | -13517 | 0 | 20116 | -1 | 2002 | 6 |
| 28480 | -9000 | 3 | 16983 | 1 | 1211 | 4 |
| 28520 | -2745 | -0 | 17671 | 0 | 267 | 1 |
| 28560 | 1804 | 1 | 23010 | 1 | -709 | -2 |
| 28600 | 1131 | -0 | 30828 | -1 | -1568 | -5 |
| 28640 | -5544 | 0 | 36491 | 2 | -2158 | -7 |
| 28680 | -14867 | -1 | 36146 | 0 | -2372 | -7 |
| 28720 | -21621 | -2 | 29971 | 2 | -2185 | -7 |
| 28760 | -22648 | -1 | 21842 | -1 | -1653 | -5 |
| 28800 | -18460 | -1 | 16131 | 3 | -889 | -3 |
| 28840 | -11969 | -1 | 15152 | 0 | -16 | 1 |
| 28880 | -6424 | -2 | 18661 | -1 | 850 | 3 |
| 28920 | -3976 | -1 | 24681 | -1 | 1416 | 5 |
| 28960 | -5160 | -0 | 30611 | 1 | 2208 | 7 |
| 29000 | -8994 | 1 | 34187 | -1 | 2574 | 8 |
| 29040 | -13426 | -0 | 34165 | 1 | 2680 | 8 |
| 29080 | -16002 | 1 | 30751 | -2 | 2512 | 8 |
| 29120 | -14729 | 0 | 25740 | -0 | 2074 | 7 |
| 29160 | -9098 | 0 | 22167 | -1 | 1401 | 4 |
| 29200 | -985 | 1 | 23183 | -0 | 558 | 1 |

# Table 7 (Cont.)

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration | t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration | t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2600 | 21323 | 4 | 931 | -1 | -1745 | 3 | 15920 | -8131 | -0 | 61950 | -1 | 1952 | 2 | 29240 | 5383 | -0 | 30066 | -0 | -353 | -2 |
| 2640 | 37310 | 1 | -2 | 1 | -1036 | 3 | 15960 | -24061 | -1 | 66719 | -1 | 1954 | 2 | 29280 | 5406 | -2 | 40284 | -2 | -1197 | -4 |
| 2680 | 43726 | 1 | 7623 | -1 | -218 | 2 | 16000 | -40239 | 0 | 64346 | -2 | 1757 | 3 | 29320 | -2184 | -1 | 47909 | -2 | -1828 | -6 |
| 2720 | 44734 | 1 | 20786 | 1 | 583 | 1 | 16040 | -52890 | -1 | 54873 | 0 | 1377 | 3 | 29360 | -13159 | -0 | 47734 | -1 | -2130 | -7 |
| 2760 | 39897 | -0 | 35741 | 1 | 1271 | -0 | 16080 | -58308 | -1 | 40632 | -0 | 845 | 2 | 29400 | -20641 | -0 | 39832 | -0 | -2056 | -7 |
| 2800 | 30300 | 2 | 49433 | -1 | 1786 | -1 | 16120 | -54391 | -1 | 26281 | 0 | 214 | 1 | 29440 | -20685 | -1 | 29277 | 0 | -1639 | -6 |
| 2840 | 16436 | 2 | 59520 | 3 | 2093 | -2 | 16160 | -42459 | -0 | 17637 | -1 | -441 | -0 | 29480 | -14598 | 0 | 21572 | -0 | -971 | -3 |
| 2880 | 1156 | 0 | 64236 | 5 | 2176 | -3 | 16200 | -28107 | -2 | 18741 | -2 | -1026 | -1 | 29520 | -6701 | -1 | 19114 | 0 | -174 | -1 |
| 2920 | -13305 | -0 | 62875 | 1 | 2038 | -3 | 16240 | -18999 | -0 | 28201 | -1 | -1437 | -2 | 29560 | -1070 | -1 | 21121 | -0 | 630 | 2 |
| 2960 | -24052 | -0 | 55719 | 2 | 1694 | -3 | 16280 | -19183 | -1 | 38615 | -2 | -1592 | -2 | 29600 | 147 | -1 | 25405 | -1 | 1331 | 5 |
| 3000 | -28465 | -1 | 44914 | 0 | 1175 | -3 | 16320 | -24849 | 2 | 42125 | -2 | -1454 | -2 | 29640 | -3287 | -1 | 29801 | -2 | 1852 | 7 |
| 3040 | -25265 | -1 | 34192 | 0 | 530 | -2 | 16360 | -27653 | -1 | 37487 | 1 | -1048 | -2 | 29680 | -10446 | -0 | 32626 | -0 | 2145 | 8 |
| 3080 | -15747 | 1 | 28037 | 0 | -172 | -1 | 16400 | -22640 | -0 | 30256 | 0 | -445 | -1 | 29720 | -19860 | -0 | 32643 | 1 | 2192 | 8 |
| 3120 | -4394 | 0 | 29593 | 0 | -839 | -0 | 16440 | -11736 | 0 | 26600 | -0 | 262 | -0 | 29760 | -29721 | 1 | 29057 | -2 | 1994 | 8 |
| 3160 | 2573 | 0 | 37898 | 1 | -1368 | 1 | 16480 | -728 | 0 | 28534 | 1 | 972 | 1 | 29800 | -37931 | 1 | 21732 | -1 | 1568 | 7 |
| 3200 | 1403 | -1 | 46937 | 1 | -1659 | 2 | 16520 | 5372 | -0 | 34130 | -0 | 1588 | 1 | 29840 | -42302 | -2 | 11572 | -1 | 954 | 5 |
| 3240 | -5056 | -1 | 49448 | -0 | -1648 | 3 | 16560 | 4644 | -0 | 40190 | 0 | 2020 | 2 | 29880 | -41224 | -1 | 830 | -0 | 216 | 2 |
| 3280 | -8880 | -1 | 43541 | -1 | -1331 | 3 | 16600 | -2100 | 0 | 44149 | 1 | 2216 | 2 | 29920 | -34752 | 1 | -7175 | -0 | -551 | -1 |
| 3320 | -4342 | 1 | 34545 | -2 | -767 | 3 | 16640 | -12776 | -0 | 44516 | -0 | 2155 | 3 | 29960 | -25487 | 1 | -9499 | 0 | -1231 | -4 |
| 3360 | 7155 | 0 | 29551 | 1 | -50 | 2 | 16680 | -25100 | 0 | 40627 | -0 | 1850 | 3 | 30000 | -17831 | -0 | -5824 | 3 | -1704 | -6 |
| 3400 | 19238 | -0 | 31428 | 1 | 706 | 1 | 16720 | -36927 | 0 | 32371 | 0 | 1331 | 2 | 30040 | -15039 | -0 | 637 | -0 | -1879 | -7 |
| 3440 | 25476 | -1 | 38057 | 1 | 1399 | 1 | 16760 | -46175 | -2 | 20151 | 1 | 651 | 2 | 30080 | -16512 | -0 | 5515 | -2 | -1727 | -7 |
| 3480 | 24660 | -3 | 45388 | -2 | 1920 | -0 | 16800 | -50782 | -1 | 5123 | -1 | -120 | 1 | 30120 | -18646 | -1 | 6979 | 1 | -1289 | -6 |
| 3520 | 16730 | -3 | 50213 | -3 | 2201 | -1 | 16840 | -49066 | 0 | -10409 | 1 | -887 | -0 | 30160 | -18293 | -4 | 6676 | 1 | -650 | -4 |
| 3560 | 4926 | -0 | 51005 | -3 | 2210 | -2 | 16880 | -40710 | 1 | -22974 | 1 | -1537 | -1 | 30200 | -14981 | -1 | 7577 | -2 | 83 | -1 |
| 3600 | -7841 | -1 | 47536 | -1 | 1954 | -2 | 16920 | -27898 | 1 | -29036 | -1 | -1954 | -1 | 30240 | -10495 | -0 | 11523 | -1 | 816 | 2 |
| 3640 | -19259 | -2 | 40329 | -0 | 1468 | -3 | 16960 | -15098 | 1 | -27265 | -0 | -2046 | -2 | 30280 | -7198 | -0 | 18236 | -2 | 1471 | 5 |
| 3680 | -27644 | -3 | 30338 | -0 | 803 | -3 | 17000 | -6445 | -0 | -19971 | 1 | -1788 | -2 | 30320 | -6586 | -0 | 25699 | -1 | 1991 | 7 |
| 3720 | -31841 | -3 | 18904 | 1 | 33 | -2 | 17040 | -2774 | -0 | -11344 | 0 | -1227 | -2 | 30360 | -8642 | -0 | 31217 | -2 | 2335 | 9 |
| 3760 | -31314 | -4 | 7802 | -1 | -752 | -1 | 17080 | -1788 | -2 | -3973 | 0 | -467 | -2 | 30400 | -11999 | 1 | 32666 | -0 | 2475 | 9 |
| 3800 | -26484 | -2 | -900 | 0 | -1441 | -0 | 17120 | -933 | -1 | 2466 | -1 | 367 | -1 | 30440 | -14672 | -0 | 29515 | 1 | 2389 | 8 |
| 3840 | -19043 | -0 | -5485 | -2 | -1918 | 1 | 17160 | 475 | 0 | 9646 | -0 | 1162 | 0 | 30480 | -14973 | 1 | 23088 | 2 | 2070 | 7 |
| 3880 | -11583 | 1 | -5642 | -1 | -2085 | 2 | 17200 | 1375 | -1 | 18486 | -2 | 1835 | 2 | 30520 | -12313 | 1 | 15871 | 2 | 1532 | 5 |
| 3920 | -6103 | 0 | -2963 | -2 | -1894 | 2 | 17240 | 293 | -2 | 28205 | -2 | 2332 | 3 | 30560 | -7539 | 1 | 10234 | 0 | 812 | 2 |
| 3960 | -2528 | 2 | 297 | -1 | -1371 | 2 | 17280 | -3408 | 1 | 36614 | -0 | 2623 | 3 | 30600 | -2527 | -2 | 7229 | -1 | -13 | -1 |
| 4000 | 839 | 2 | 3322 | -2 | -613 | 2 | 17320 | -8996 | -0 | 41177 | -0 | 2690 | 3 | 30640 | 1042 | -1 | 6093 | 0 | -834 | -4 |
| 4040 | 5202 | 2 | 7224 | 1 | 248 | 1 | 17360 | -14625 | 0 | 40328 | -1 | 2528 | 3 | 30680 | 3032 | 1 | 5054 | 1 | -1518 | -6 |
| 4080 | 9985 | -1 | 13507 | 0 | 1084 | 1 | 17400 | -18121 | -1 | 34410 | -1 | 2136 | 3 | 30720 | 4985 | 1 | 3172 | 1 | -1941 | -8 |
| 4120 | 13395 | -0 | 22416 | 1 | 1798 | 0 | 17440 | -17953 | 1 | 25621 | -1 | 1535 | 3 | 30760 | 8482 | -1 | 1444 | 2 | -2031 | -8 |
| 4160 | 13305 | -1 | 32446 | 1 | 2324 | -1 | 17480 | -14045 | 1 | 17018 | 0 | 768 | 2 | 30800 | 13413 | -2 | 1839 | 2 | -1786 | -6 |
| 4200 | 10808 | 1 | 40932 | 1 | 2631 | -1 | 17520 | -7976 | 1 | 11075 | 1 | -89 | 0 | 30840 | 18082 | -3 | 5477 | 1 | -1271 | -4 |
| 4240 | 5502 | 1 | 45163 | 1 | 2704 | -2 | 17560 | -2226 | 0 | 8444 | 0 | -932 | -1 | 30880 | 20566 | -1 | 11958 | -0 | -584 | -1 |
| 4280 | 34 | 1 | 43619 | 1 | 2540 | -2 | 17600 | 1439 | -1 | 7702 | 1 | -1631 | -2 | 30920 | 19710 | 1 | 19921 | 1 | 172 | 2 |
| 4320 | -3306 | -0 | 36841 | 2 | 2144 | -2 | 17640 | 3382 | -0 | 6675 | 0 | -2060 | -2 | 30960 | 15287 | 1 | 27809 | 1 | 900 | 5 |
| 4360 | -3074 | -2 | 27315 | 1 | 1538 | -2 | 17680 | 5722 | 0 | 4650 | 1 | -2136 | -3 | 31000 | 7742 | 1 | 34282 | 1 | 1523 | 7 |
| 4400 | 582 | -1 | 18275 | -0 | 768 | -2 | 17720 | 10109 | -1 | 3189 | -1 | -1849 | -3 | 31040 | -2024 | 1 | 38309 | 0 | 1982 | 9 |
| 4440 | 5832 | -0 | 12081 | -1 | -93 | -1 | 17760 | 16035 | 1 | 4575 | -0 | -1265 | -2 | 31080 | -12707 | 2 | 39185 | -3 | 2231 | 10 |
| 4480 | 10087 | -1 | 8921 | -1 | -941 | -0 | 17800 | 21347 | 0 | 9840 | -1 | -495 | -1 | 31120 | -22531 | 2 | 36630 | 0 | 2243 | 10 |
| 4520 | 11850 | 1 | 6665 | -1 | -1653 | 0 | 17840 | 23835 | -2 | 18269 | -0 | 337 | -0 | 31160 | -29283 | -0 | 31093 | 0 | 2009 | 8 |
| 4560 | 12402 | 1 | 2590 | -1 | -2103 | 1 | 17880 | 22245 | -0 | 28086 | -1 | 1122 | 1 | 31200 | -30781 | 1 | 24160 | -0 | 1543 | 6 |
| 4600 | 15292 | 1 | -3672 | -2 | -2197 | 2 | 17920 | 16453 | 1 | 37277 | 1 | 1774 | 2 | 31240 | -26124 | 1 | 18723 | -0 | 891 | 3 |
| 4640 | 23041 | 1 | -8866 | -3 | -1911 | 3 | 17960 | 7259 | -0 | 44085 | 3 | 2233 | 3 | 31280 | -17266 | -0 | 18126 | 0 | 132 | -0 |
| 4680 | 34245 | 0 | -8659 | -2 | -1305 | 2 | 18000 | -3840 | -1 | 47244 | -1 | 2459 | 3 | 31320 | -9227 | 1 | 23796 | 2 | -627 | -3 |
| 4720 | 44502 | 0 | -1344 | -0 | -494 | 2 | 18040 | -14798 | 2 | 46130 | 0 | 2432 | 3 | 31360 | -7271 | -0 | 32840 | 3 | -1267 | -6 |
| 4760 | 49696 | 1 | 11242 | -1 | 383 | 1 | 18080 | -23187 | 1 | 40974 | 2 | 2143 | 3 | 31400 | -12377 | -1 | 39049 | 0 | -1676 | -8 |
| 4800 | 48090 | 1 | 25493 | -1 | 1203 | 1 | 18120 | -26630 | -1 | 33131 | 1 | 1646 | 2 | 31440 | -19792 | 0 | 38009 | -1 | -1782 | -8 |
| 4840 | 40230 | 2 | 38057 | 0 | 1874 | -0 | 18160 | -23770 | -2 | 25193 | -0 | 963 | 2 | 31480 | -23254 | -1 | 31039 | 2 | -1579 | -7 |
| 4880 | 28191 | 2 | 46783 | 2 | 2330 | -1 | 18200 | -15597 | -0 | 20455 | -1 | 181 | 1 | 31520 | -20247 | -1 | 23417 | 2 | -1121 | -5 |
| 4920 | 14184 | 0 | 50775 | 0 | 2536 | -2 | 18240 | -6007 | 1 | 21199 | 0 | -597 | -0 | 31560 | -12891 | -2 | 19743 | 1 | -497 | -2 |
| 4960 | 631 | -1 | 50049 | -0 | 2478 | -2 | 18280 | -68 | 1 | 26410 | 1 | -1259 | -1 | 31600 | -5272 | -1 | 21380 | -1 | 196 | 1 |
| 5000 | -10172 | 1 | 45480 | -1 | 2163 | -2 | 18320 | -234 | -1 | 31487 | -1 | -1694 | -2 | 31640 | -739 | 1 | 26830 | -1 | 870 | 4 |
| 5040 | -16045 | 1 | 38352 | -2 | 1619 | -1 | 18360 | -3813 | -0 | 31792 | -2 | -1826 | -3 | 31680 | -738 | -2 | 33286 | -3 | 1452 | 7 |
| 5080 | -15408 | -1 | 30912 | 1 | 909 | -1 | 18400 | -5276 | 1 | 27117 | -0 | -1637 | -3 | 31720 | -4875 | 0 | 38011 | -0 | 1883 | 8 |

# Table 7 (Cont.)

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|
| 5120 | -9406 | -3 | 26145 | 1 | 91 | -1 |
| 5160 | 1942 | -2 | 26856 | -1 | -704 | -1 |
| 5200 | 9767 | -3 | 33330 | -1 | -1369 | 0 |
| 5240 | 10709 | -1 | 41644 | -1 | -1793 | 1 |
| 5280 | 5348 | -1 | 45120 | -3 | -1898 | 2 |
| 5320 | 98 | 2 | 40618 | -2 | -1660 | 2 |
| 5360 | 1400 | 2 | 31795 | -0 | -1130 | 2 |
| 5400 | 9943 | 1 | 25694 | -2 | -411 | 1 |
| 5440 | 21307 | 1 | 26716 | -1 | 373 | 1 |
| 5480 | 28359 | 3 | 34342 | -1 | 1109 | 0 |
| 5520 | 30156 | 0 | 44838 | 0 | 1712 | -1 |
| 5560 | 24690 | -0 | 53763 | 0 | 2124 | -1 |
| 5600 | 14526 | 0 | 58048 | 3 | 2310 | -2 |
| 5640 | 2719 | 1 | 56369 | 0 | 2258 | -2 |
| 5680 | -7774 | 0 | 49237 | 2 | 1973 | -2 |
| 5720 | -14849 | 1 | 38516 | 2 | 1474 | -1 |
| 5760 | -17630 | -0 | 26782 | 1 | 800 | -0 |
| 5800 | -16501 | -0 | 16657 | 0 | 7 | 0 |
| 5840 | -12802 | -2 | 10234 | 1 | -823 | 0 |
| 5880 | -8427 | -2 | 8623 | -1 | -1578 | 1 |
| 5920 | -5464 | -0 | 11336 | -2 | -2119 | 1 |
| 5960 | -5390 | 2 | 15773 | -0 | -2318 | 2 |
| 6000 | -7474 | -0 | 18377 | 1 | -2109 | 2 |
| 6040 | -8621 | -1 | 17667 | -0 | -1524 | 1 |
| 6080 | -6173 | 2 | 15651 | -1 | -677 | 1 |
| 6120 | -436 | -1 | 15676 | -1 | 285 | 0 |
| 6160 | 5861 | -1 | 19504 | -1 | 1219 | -0 |
| 6200 | 9755 | -0 | 26393 | -1 | 2014 | -1 |
| 6240 | 9670 | 0 | 33973 | 1 | 2590 | -1 |
| 6280 | 5841 | 1 | 39586 | 1 | 2899 | -1 |
| 6320 | -58 | -0 | 41333 | 2 | 2921 | -1 |
| 6360 | -5628 | -1 | 38643 | 1 | 2656 | -2 |
| 6400 | -8573 | -1 | 32439 | -0 | 2127 | -1 |
| 6440 | -7513 | -0 | 24902 | -0 | 1379 | -1 |
| 6480 | -2668 | -2 | 18803 | 0 | 480 | -0 |
| 6520 | 3898 | -3 | 16353 | 1 | -473 | 0 |
| 6560 | 8939 | -2 | 17848 | -2 | -1358 | 1 |
| 6600 | 9858 | 1 | 21026 | 2 | -2039 | 1 |
| 6640 | 6816 | -1 | 22371 | -2 | -2391 | 1 |
| 6680 | 2920 | -1 | 20087 | -0 | -2345 | 1 |
| 6720 | 1691 | 0 | 15749 | -3 | -1910 | 1 |
| 6760 | 4384 | 3 | 12701 | 0 | -1174 | 1 |
| 6800 | 9588 | -1 | 13475 | 0 | -269 | 1 |
| 6840 | 14557 | 0 | 18601 | -1 | 667 | 1 |
| 6880 | 16799 | -1 | 26727 | -2 | 1516 | 0 |
| 6920 | 15092 | 0 | 35417 | 1 | 2189 | 0 |
| 6960 | 9751 | 1 | 42107 | 0 | 2629 | -0 |
| 7000 | 2389 | 0 | 44890 | 3 | 2801 | -1 |
| 7040 | -4605 | -1 | 43043 | 2 | 2695 | -1 |
| 7080 | -6753 | 0 | 37291 | 0 | 2320 | -1 |
| 7120 | -8280 | -0 | 29774 | -0 | 1708 | -0 |
| 7160 | -2975 | -2 | 23572 | -1 | 913 | -0 |
| 7200 | 5203 | -2 | 21598 | -0 | 20 | -0 |
| 7240 | 12378 | -3 | 24889 | -1 | -862 | -0 |
| 7280 | 14636 | -2 | 31115 | -3 | -1600 | 0 |
| 7320 | 11201 | -1 | 35201 | -4 | -2062 | 1 |
| 7360 | 6076 | 1 | 33123 | -4 | -2157 | 1 |
| 7400 | 5039 | 1 | 25936 | -2 | -1867 | 1 |
| 7440 | 10223 | -0 | 18983 | -1 | -1257 | 1 |
| 7480 | 18475 | 1 | 16081 | -2 | -455 | 0 |
| 7520 | 24719 | 1 | 20828 | -1 | 390 | -0 |
| 7560 | 25667 | 1 | 29765 | -1 | 1140 | -1 |
| 7600 | 20746 | 1 | 37402 | 1 | 1700 | -0 |

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|
| 18440 | -1456 | 0 | 21752 | 0 | -1176 | -2 |
| 18480 | 6181 | -1 | 20351 | 1 | -536 | -1 |
| 18520 | 13580 | -1 | 24591 | 1 | 177 | -0 |
| 18560 | 17110 | -1 | 33010 | 1 | 863 | 1 |
| 18600 | 15085 | -1 | 42580 | 1 | 1445 | 2 |
| 18640 | 7798 | 0 | 50236 | -1 | 1866 | 3 |
| 18680 | -3082 | 0 | 53750 | 1 | 2087 | 3 |
| 18720 | -15188 | -2 | 52067 | -1 | 2088 | 4 |
| 18760 | -26008 | 2 | 45353 | -2 | 1865 | 4 |
| 18800 | -33321 | -0 | 34924 | -0 | 1431 | 3 |
| 18840 | -35607 | 0 | 23139 | 1 | 818 | 2 |
| 18880 | -32509 | -1 | 13161 | -0 | 84 | 1 |
| 18920 | -25392 | 2 | 8292 | 1 | -680 | -0 |
| 18960 | -17616 | 1 | 10350 | 1 | -1350 | -1 |
| 19000 | -13360 | 0 | 17477 | 1 | -1791 | -2 |
| 19040 | -14261 | -0 | 24201 | 1 | -1900 | -3 |
| 19080 | -17063 | -1 | 25902 | 1 | -1656 | -3 |
| 19120 | -16596 | -2 | 23191 | 1 | -1116 | -2 |
| 19160 | -10878 | 0 | 20685 | -1 | -389 | -1 |
| 19200 | -2317 | 1 | 22406 | -0 | 403 | -0 |
| 19240 | 4890 | 0 | 29078 | 2 | 1151 | 1 |
| 19280 | 7561 | -0 | 38499 | -0 | 1773 | 2 |
| 19320 | 4758 | 1 | 47245 | 0 | 2209 | 3 |
| 19360 | -2320 | -1 | 52245 | -0 | 2423 | 4 |
| 19400 | -11097 | 1 | 51740 | -1 | 2398 | 4 |
| 19440 | -18559 | -1 | 45685 | -0 | 2135 | 4 |
| 19480 | -22207 | -0 | 35686 | 2 | 1653 | 4 |
| 19520 | -20910 | -0 | 24492 | 1 | 992 | 3 |
| 19560 | -15641 | 1 | 14991 | 1 | 216 | 1 |
| 19600 | -8265 | -0 | 8862 | 0 | -585 | -0 |
| 19640 | -2183 | 0 | 5608 | 1 | -1300 | -2 |
| 19680 | 1613 | 0 | 3209 | -3 | -1813 | -3 |
| 19720 | 4119 | 2 | 521 | 1 | -2036 | -3 |
| 19760 | 6768 | 0 | -1266 | 1 | -1936 | -3 |
| 19800 | 9941 | -1 | -217 | 1 | -1545 | -3 |
| 19840 | 13302 | 1 | 4502 | -2 | -943 | -2 |
| 19880 | 16081 | -0 | 12840 | 1 | -228 | -1 |
| 19920 | 16925 | -1 | 24233 | -0 | 501 | 1 |
| 19960 | 14289 | 0 | 37323 | -1 | 1164 | 2 |
| 20000 | 7241 | 1 | 49876 | -0 | 1697 | 3 |
| 20040 | -3898 | -1 | 59247 | 1 | 2054 | 4 |
| 20080 | -17352 | -0 | 63134 | -2 | 2205 | 4 |
| 20120 | -30134 | 1 | 60383 | 1 | 2136 | 4 |
| 20160 | -38712 | -1 | 51657 | 1 | 1849 | 4 |
| 20200 | -40125 | 1 | 39801 | 0 | 1364 | 3 |
| 20240 | -33481 | 0 | 29489 | 0 | 723 | 2 |
| 20280 | -21351 | -1 | 25627 | 0 | -5 | 0 |
| 20320 | -9752 | -1 | 30387 | -1 | -721 | -1 |
| 20360 | -5106 | 0 | 40425 | -1 | -1308 | -3 |
| 20400 | -8899 | 0 | 47935 | -3 | -1658 | -4 |
| 20440 | -15402 | -0 | 46921 | -2 | -1701 | -4 |
| 20480 | -16776 | 1 | 38734 | -1 | -1432 | -4 |
| 20520 | -10379 | 0 | 30025 | -0 | -906 | -3 |
| 20560 | -34 | 0 | 26263 | -1 | -221 | -1 |
| 20600 | 8407 | 1 | 28482 | -1 | 504 | 0 |
| 20640 | 11237 | -1 | 34537 | -1 | 1155 | 1 |
| 20680 | 7768 | -0 | 41433 | 0 | 1649 | 2 |
| 20720 | -812 | 0 | 46624 | -0 | 1938 | 4 |
| 20760 | -12546 | 1 | 48349 | 0 | 2002 | 5 |
| 20800 | -25193 | -0 | 45631 | -0 | 1840 | 5 |
| 20840 | -36361 | 1 | 38317 | -1 | 1469 | 4 |
| 20880 | -43671 | -0 | 27282 | -1 | 924 | 3 |
| 20920 | -45219 | 1 | 14661 | -1 | 259 | 2 |

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|
| 31760 | -11485 | 1 | 39144 | 1 | 2124 | 9 |
| 31800 | -18326 | -0 | 36056 | 1 | 2147 | 10 |
| 31840 | -23217 | -0 | 29397 | 2 | 1939 | 9 |
| 31880 | -24629 | -1 | 20933 | 0 | 1507 | 7 |
| 31920 | -22197 | 3 | 13152 | 1 | 878 | 4 |
| 31960 | -17042 | -1 | 8591 | 1 | 110 | 0 |
| 32000 | -11692 | -3 | 8836 | 0 | -703 | -3 |
| 32040 | -9237 | 1 | 13340 | 1 | -1431 | -6 |
| 32080 | -11538 | -0 | 18934 | 2 | -1932 | -8 |
| 32120 | -17373 | -1 | 21536 | -0 | -2102 | -8 |
| 32160 | -22867 | -4 | 19408 | 3 | -1911 | -7 |
| 32200 | -24559 | -2 | 14440 | 1 | -1408 | -5 |
| 32240 | -21807 | 1 | 10160 | 1 | -692 | -2 |
| 32280 | -16519 | -1 | 9119 | 1 | 125 | 1 |
| 32320 | -11450 | -1 | 11794 | -0 | 933 | 4 |
| 32360 | -8743 | 0 | 16948 | 1 | 1645 | 6 |
| 32400 | -9271 | -2 | 22510 | -1 | 2189 | 8 |
| 32440 | -12573 | 0 | 26426 | -2 | 2513 | 9 |
| 32480 | -17134 | -0 | 27310 | 1 | 2584 | 10 |
| 32520 | -20871 | -2 | 24892 | 0 | 2388 | 9 |
| 32560 | -21803 | 0 | 20262 | -0 | 1930 | 7 |
| 32600 | -18905 | -0 | 15763 | 0 | 1244 | 4 |
| 32640 | -13006 | 1 | 14278 | 2 | 397 | 1 |
| 32680 | -7135 | -2 | 17693 | -0 | -505 | -2 |
| 32720 | -5376 | 0 | 25046 | 2 | -1327 | -5 |
| 32760 | -9988 | 0 | 32135 | -0 | -1925 | -8 |
| 32800 | -18942 | -1 | 34183 | 3 | -2190 | -9 |
| 32840 | -27028 | -3 | 29753 | -0 | -2083 | -8 |
| 32880 | -29891 | -1 | 21724 | 0 | -1643 | -6 |
| 32920 | -26807 | -0 | 14652 | -1 | -962 | -3 |
| 32960 | -20198 | 0 | 11696 | 1 | -152 | 0 |
| 33000 | -13478 | -1 | 13443 | -0 | 677 | 3 |
| 33040 | -9275 | -1 | 18415 | 0 | 1432 | 7 |
| 33080 | -8660 | 0 | 24184 | -2 | 2037 | 9 |
| 33120 | -11137 | 1 | 28393 | -2 | 2436 | 10 |
| 33160 | -15027 | 2 | 29494 | -3 | 2589 | 10 |
| 33200 | -18060 | 1 | 27226 | -0 | 2477 | 10 |
| 33240 | -18152 | 1 | 22813 | -0 | 2097 | 8 |
| 33280 | -14329 | 0 | 18778 | 1 | 1475 | 5 |
| 33320 | -7625 | -2 | 18096 | -1 | 670 | 2 |
| 33360 | -1333 | 0 | 22531 | -1 | -224 | -1 |
| 33400 | 336 | 0 | 30747 | -1 | -1076 | -5 |
| 33440 | -4653 | 0 | 38057 | 0 | -1739 | -7 |
| 33480 | -13690 | 0 | 39451 | 1 | -2091 | -8 |
| 33520 | -21112 | -1 | 33843 | 3 | -2074 | -8 |
| 33560 | -22887 | -2 | 24762 | 1 | -1711 | -6 |
| 33600 | -19247 | -1 | 16963 | -1 | -1088 | -3 |
| 33640 | -13301 | -3 | 13245 | -1 | -326 | -0 |
| 33680 | -8354 | -2 | 13937 | -4 | 453 | 3 |
| 33720 | -6479 | 1 | 17854 | -3 | 1148 | 6 |
| 33760 | -8468 | 1 | 23170 | -3 | 1688 | 9 |
| 33800 | -14165 | 0 | 27891 | -0 | 2031 | 10 |
| 33840 | -22616 | 0 | 30157 | -0 | 2149 | 11 |
| 33880 | -32093 | 2 | 28583 | 1 | 2034 | 10 |
| 33920 | -40215 | 1 | 22713 | -0 | 1691 | 8 |
| 33960 | -44399 | 2 | 13527 | -0 | 1148 | 5 |
| 34000 | -42820 | 1 | 3718 | 0 | 456 | 2 |
| 34040 | -35767 | 1 | -2830 | 1 | -301 | -2 |
| 34080 | -26567 | 2 | -2937 | 1 | -1012 | -5 |
| 34120 | -20432 | 0 | 3195 | 2 | -1556 | -8 |
| 34160 | -20770 | -1 | 11140 | 1 | -1828 | -9 |
| 34200 | -26045 | 0 | 15448 | -2 | -1781 | -8 |
| 34240 | -31147 | 1 | 14212 | -0 | -1435 | -7 |

Table 7 (Cont.)

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|
| 7640 | 10972 | 0 | 45989 | 1 | 2022 | -1 |
| 7680 | -2271 | 1 | 51209 | 1 | 2094 | -1 |
| 7720 | -17214 | -0 | 52226 | 1 | 1927 | -1 |
| 7760 | -31762 | -1 | 48210 | 1 | 1547 | -1 |
| 7800 | -43520 | -1 | 39171 | -1 | 995 | -1 |
| 7840 | -49907 | -1 | 26407 | 1 | 329 | -0 |
| 7880 | -49180 | -1 | 12782 | 0 | -374 | -0 |
| 7920 | -41565 | 0 | 2294 | -1 | -1022 | -0 |
| 7960 | -30176 | 1 | -1582 | 1 | -1512 | -0 |
| 8000 | -20133 | 0 | 1599 | -1 | -1751 | 0 |
| 8040 | -15226 | -0 | 8189 | -4 | -1683 | 1 |
| 8080 | -14697 | 1 | 13162 | -2 | -1315 | 1 |
| 8120 | -14221 | 1 | 14613 | 1 | -717 | 1 |
| 8160 | -10353 | 0 | 14899 | -1 | 7 | 0 |
| 8200 | -3337 | 2 | 17583 | -0 | 748 | 0 |
| 8240 | 3843 | 3 | 24386 | 1 | 1418 | -0 |
| 8280 | 8031 | 2 | 32802 | 1 | 1955 | -0 |
| 8320 | 7711 | 1 | 40357 | 1 | 2313 | -0 |
| 8360 | 3382 | 0 | 43649 | 1 | 2459 | -1 |
| 8400 | -3085 | 1 | 41383 | 2 | 2368 | -1 |
| 8440 | -9503 | -1 | 34287 | 2 | 2034 | -1 |
| 8480 | -14320 | -0 | 24233 | 1 | 1481 | -1 |
| 8520 | -17020 | 1 | 13068 | -0 | 755 | -0 |
| 8560 | -17788 | -1 | 1827 | -0 | -66 | -0 |
| 8600 | -16693 | -1 | -9390 | -2 | -884 | -0 |
| 8640 | -12939 | 1 | -20677 | -1 | -1577 | -0 |
| 8680 | -5067 | 1 | -31011 | -1 | -2022 | -0 |
| 8720 | 7438 | 1 | -37612 | -1 | -2129 | 0 |
| 8760 | 22470 | 0 | -37367 | -0 | -1870 | 0 |
| 8800 | 35858 | 1 | -29382 | -0 | -1300 | 0 |
| 8840 | 43972 | -1 | -15755 | -0 | -530 | 0 |
| 8880 | 45520 | -2 | 85 | -0 | 311 | 0 |
| 8920 | 41237 | -0 | 15300 | -2 | 1105 | 0 |
| 8960 | 32659 | 0 | 28266 | -1 | 1761 | -0 |
| 9000 | 21322 | 1 | 38201 | 1 | 2220 | 0 |
| 9040 | 8651 | 0 | 44602 | -1 | 2450 | 0 |
| 9080 | -3736 | 1 | 46987 | -3 | 2439 | -0 |
| 9120 | -13753 | 1 | 45050 | -1 | 2198 | -0 |
| 9160 | -19051 | -1 | 39221 | 2 | 1753 | -0 |
| 9200 | -17954 | 1 | 31311 | 0 | 1148 | -0 |
| 9240 | -10816 | -1 | 24521 | 1 | 445 | -0 |
| 9280 | -755 | -1 | 21961 | -0 | -282 | -0 |
| 9320 | 7391 | -2 | 24121 | 0 | -941 | -0 |
| 9360 | 10228 | -2 | 27591 | -3 | -1435 | -0 |
| 9400 | 9072 | -0 | 27475 | -3 | -1675 | 0 |
| 9440 | 9298 | 2 | 22349 | -3 | -1618 | 0 |
| 9480 | 15111 | 0 | 16230 | 0 | -1279 | 0 |
| 9520 | 25467 | -1 | 14779 | 1 | -733 | -0 |
| 9560 | 35473 | -0 | 20463 | -0 | -80 | 0 |
| 9600 | 40409 | 1 | 31533 | -1 | 581 | 0 |
| 9640 | 36160 | 1 | 44059 | 1 | 1166 | -0 |
| 9680 | 29294 | -0 | 54213 | -1 | 1613 | -1 |
| 9720 | 16021 | 0 | 59481 | 2 | 1882 | -0 |
| 9760 | 1121 | 2 | 58922 | 3 | 1949 | 1 |
| 9800 | -12787 | 0 | 52937 | 1 | 1805 | 1 |
| 9840 | -23613 | -1 | 42899 | 2 | 1457 | 1 |
| 9880 | -29911 | -1 | 30546 | 1 | 927 | 1 |
| 9920 | -30931 | 1 | 19304 | 0 | 258 | 0 |
| 9960 | -26871 | -2 | 11071 | -0 | -478 | 0 |
| 10000 | -19535 | -3 | 8487 | -3 | -1173 | 0 |
| 10040 | -12596 | -0 | 11406 | -1 | -1693 | -0 |
| 10080 | -9625 | 0 | 17674 | -3 | -1921 | -0 |
| 10120 | -10616 | -0 | 21789 | -0 | -1799 | 0 |
| 20960 | -40458 | 0 | 3750 | 1 | -447 | 0 |
| 21000 | -31181 | -0 | -1959 | -0 | -1094 | -1 |
| 21040 | -21564 | -1 | -818 | -1 | -1571 | -3 |
| 21080 | -16015 | 1 | 5127 | 1 | -1783 | -4 |
| 21120 | -15699 | -1 | 11084 | 1 | -1681 | -4 |
| 21160 | -17507 | -1 | 13537 | 0 | -1286 | -4 |
| 21200 | -17228 | -1 | 13093 | -0 | -674 | -2 |
| 21240 | -13252 | -0 | 13099 | 0 | 53 | -1 |
| 21280 | -7180 | 0 | 16340 | -0 | 792 | 1 |
| 21320 | -1993 | 1 | 23107 | 0 | 1463 | 2 |
| 21360 | -33 | 1 | 31355 | 1 | 2004 | 3 |
| 21400 | -1991 | -1 | 38033 | 1 | 2369 | 4 |
| 21440 | -6901 | -1 | 40645 | -1 | 2521 | 5 |
| 21480 | -12745 | -1 | 38278 | -1 | 2432 | 5 |
| 21520 | -17311 | -1 | 31722 | 0 | 2097 | 5 |
| 21560 | -19001 | -0 | 22933 | 1 | 1533 | 4 |
| 21600 | -17355 | -1 | 14271 | 1 | 787 | 3 |
| 21640 | -13169 | 1 | 7745 | -0 | -64 | 1 |
| 21680 | -8134 | 1 | 4315 | 0 | -911 | -1 |
| 21720 | -3979 | 1 | 3517 | 1 | -1620 | -2 |
| 21760 | -1402 | 1 | 3846 | -1 | -2062 | -3 |
| 21800 | 378 | 0 | 3988 | 1 | -2148 | -4 |
| 21840 | 2763 | 0 | 3973 | 1 | -1865 | -4 |
| 21880 | 6340 | 0 | 5043 | -0 | -1276 | -3 |
| 21920 | 10310 | -1 | 8458 | -1 | -493 | -2 |
| 21960 | 13091 | -1 | 14519 | -1 | 359 | 0 |
| 22000 | 13251 | 0 | 22432 | -0 | 1168 | 2 |
| 22040 | 10089 | -1 | 30698 | -2 | 1845 | 3 |
| 22080 | 3841 | -1 | 37588 | -3 | 2327 | 5 |
| 22120 | -4320 | -0 | 41545 | 0 | 2574 | 5 |
| 22160 | -12397 | -1 | 41557 | 1 | 2567 | 5 |
| 22200 | -17907 | -2 | 37566 | 0 | 2307 | 5 |
| 22240 | -18661 | -1 | 30869 | -1 | 1818 | 4 |
| 22280 | -13933 | 2 | 24176 | -1 | 1145 | 3 |
| 22320 | -5454 | 2 | 20714 | 0 | 355 | 1 |
| 22360 | 2783 | -1 | 22218 | -0 | -461 | -1 |
| 22400 | 6583 | -1 | 27038 | -0 | -1191 | -3 |
| 22440 | 4812 | -0 | 30657 | -0 | -1716 | -4 |
| 22480 | 899 | -0 | 29383 | -1 | -1940 | -5 |
| 22520 | 23 | -1 | 23984 | -0 | -1827 | -4 |
| 22560 | 4450 | 1 | 18950 | 0 | -1413 | -4 |
| 22600 | 12092 | 1 | 18398 | 0 | -781 | -2 |
| 22640 | 18848 | -1 | 23321 | -1 | -41 | -1 |
| 22680 | 21424 | 0 | 31851 | -1 | 705 | 1 |
| 22720 | 18562 | -1 | 40932 | -0 | 1369 | 3 |
| 22760 | 10869 | -0 | 47762 | -2 | 1881 | 4 |
| 22800 | 124 | 0 | 50515 | -1 | 2194 | 5 |
| 22840 | -11404 | -1 | 48527 | 0 | 2276 | 6 |
| 22880 | -21434 | -1 | 42230 | 0 | 2111 | 5 |
| 22920 | -27979 | -0 | 33045 | 1 | 1705 | 4 |
| 22960 | -29632 | 2 | 23302 | 1 | 1085 | 3 |
| 23000 | -26041 | 0 | 16062 | -1 | 309 | 1 |
| 23040 | -18719 | 3 | 14335 | 1 | -522 | -0 |
| 23080 | -11558 | 1 | 19169 | 2 | -1269 | -2 |
| 23120 | -9122 | 1 | 27594 | -1 | -1787 | -4 |
| 23160 | -12435 | -0 | 33584 | 2 | -1973 | -5 |
| 23200 | -17121 | -1 | 33081 | 1 | -1795 | -5 |
| 23240 | -17508 | 0 | 27793 | -1 | -1304 | -4 |
| 23280 | -11857 | 2 | 23087 | 0 | -601 | -2 |
| 23320 | -2997 | 1 | 23130 | 1 | 196 | -1 |
| 23360 | 4640 | 1 | 28462 | 1 | 976 | 1 |
| 23400 | 7848 | 2 | 36674 | 3 | 1652 | 3 |
| 23440 | 5759 | 0 | 44280 | 2 | 2159 | 5 |
| 34280 | -31872 | -2 | 10012 | 1 | -861 | -4 |
| 34320 | -27639 | -0 | 7000 | 1 | -155 | -1 |
| 34360 | -20814 | 0 | 7772 | 0 | 590 | 3 |
| 34400 | -14544 | 0 | 12259 | 1 | 1291 | 6 |
| 34440 | -11023 | 0 | 18377 | 2 | 1883 | 9 |
| 34480 | -10814 | 1 | 23420 | -0 | 2306 | 10 |
| 34520 | -13017 | -1 | 25380 | -1 | 2515 | 11 |
| 34560 | -15887 | 1 | 23648 | -1 | 2476 | 10 |
| 34600 | -17608 | 1 | 18995 | -2 | 2177 | 9 |
| 34640 | -16990 | 3 | 13125 | -2 | 1631 | 6 |
| 34680 | -13929 | 3 | 8054 | 0 | 881 | 3 |
| 34720 | -9516 | 4 | 5382 | 2 | 10 | -1 |
| 34760 | -5627 | 2 | 5547 | 1 | -865 | -5 |
| 34800 | -3905 | -1 | 7461 | 0 | -1601 | -8 |
| 34840 | -4580 | -1 | 9145 | 2 | -2043 | -10 |
| 34880 | -6258 | -0 | 9227 | 2 | -2169 | -9 |
| 34920 | -7109 | -1 | 7975 | 2 | -1915 | -8 |
| 34960 | -6278 | -2 | 6861 | 0 | -1367 | -5 |
| 35000 | -4239 | -2 | 7367 | 1 | -628 | -2 |
| 35040 | -2262 | -4 | 10168 | -3 | 188 | 1 |
| 35080 | -1691 | -2 | 14954 | -3 | 981 | 5 |
| 35120 | -3416 | -0 | 20643 | -1 | 1667 | 8 |
| 35160 | -7560 | 0 | 25741 | 1 | 2182 | 10 |
| 35200 | -13333 | -1 | 28769 | 1 | 2477 | 11 |
| 35240 | -19071 | -0 | 28740 | -0 | 2524 | 10 |
| 35280 | -22582 | -1 | 25669 | 0 | 2309 | 9 |
| 35320 | -21968 | 0 | 20978 | 0 | 1845 | 6 |
| 35360 | -16826 | -0 | 17429 | -0 | 1169 | 3 |
| 35400 | -9233 | 1 | 17996 | 0 | 349 | -1 |
| 35440 | -3451 | 2 | 23485 | 2 | -511 | -4 |
| 35480 | -3547 | 0 | 31808 | 4 | -1279 | -7 |
| 35520 | -9961 | -1 | 37076 | 2 | -1821 | -9 |
| 35560 | -18493 | -2 | 35738 | 1 | -2041 | -9 |
| 35600 | -23649 | -1 | 28771 | 1 | -1912 | -8 |
| 35640 | -22895 | -1 | 20613 | 1 | -1481 | -5 |
| 35680 | -17607 | -1 | 15471 | 1 | -836 | -2 |
| 35720 | -11098 | -1 | 15069 | 0 | -84 | 1 |
| 35760 | -6423 | -1 | 18697 | 1 | 675 | 5 |
| 35800 | -5290 | -1 | 24293 | -0 | 1355 | 7 |
| 35840 | -7905 | -0 | 29492 | -3 | 1889 | 10 |
| 35880 | -13248 | 1 | 32327 | 0 | 2224 | 11 |
| 35920 | -19471 | 0 | 31687 | 2 | 2325 | 11 |
| 35960 | -24365 | 1 | 27616 | 1 | 2176 | 10 |
| 36000 | -25941 | 1 | 21493 | -2 | 1777 | 8 |
| 36040 | -23198 | 3 | 15930 | -2 | 1156 | 5 |
| 36080 | -17010 | 0 | 14082 | 1 | 876 | 0 |
| 36120 | -10616 | 1 | 17994 | -1 | -460 | -4 |
| 36160 | -8537 | 1 | 26425 | 1 | -1217 | -7 |
| 36200 | -13255 | -0 | 34369 | 1 | -1755 | -9 |
| 36240 | -22276 | -1 | 36389 | 2 | -1976 | -10 |
| 36280 | -29732 | -1 | 31751 | -0 | -1850 | -9 |
| 36320 | -31287 | -1 | 22612 | 0 | -1421 | -7 |
| 36360 | -26867 | -2 | 15500 | -0 | -778 | -4 |
| 36400 | -19500 | -2 | 12957 | -0 | -28 | 0 |
| 36440 | -12804 | -3 | 15184 | -1 | 727 | 4 |
| 36480 | -9293 | -1 | 20408 | -1 | 1401 | 7 |
| 36520 | -9833 | -1 | 26114 | -1 | 1925 | 10 |
| 36560 | -13803 | 1 | 29988 | -1 | 2251 | 11 |
| 36600 | -19514 | 0 | 30504 | -1 | 2343 | 12 |
| 36640 | -24734 | 1 | 27269 | -0 | 2186 | 11 |
| 36680 | -27305 | 1 | 21201 | 1 | 1784 | 9 |
| 36720 | -25900 | 1 | 14464 | -1 | 1168 | 5 |
| 36760 | -20830 | 1 | 9924 | -1 | 396 | 1 |

Table 7 (Cont.)

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration | t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration | t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10160 | -11667 | -0 | 21253 | -1 | -1350 | 0 | 23480 | -393 | 0 | 48313 | 1 | 2452 | 6 | 36800 | -14496 | 1 | 9925 | 1 | -436 | -3 |
| 10200 | -9079 | -1 | 18531 | -1 | -663 | 0 | 23520 | -8118 | 0 | 47220 | 1 | 2506 | 6 | 36840 | -10711 | 1 | 14643 | 2 | -1204 | -6 |
| 10240 | -2772 | 2 | 17725 | -1 | 138 | 0 | 23560 | -14658 | -1 | 41134 | 1 | 2310 | 6 | 36880 | -12437 | -0 | 21239 | 0 | -1776 | -9 |
| 10280 | 4308 | 1 | 21169 | 0 | 931 | 0 | 23600 | -17889 | 0 | 31677 | 1 | 1876 | 5 | 36920 | -19142 | -1 | 25282 | 1 | -2046 | -10 |
| 10320 | 8790 | 1 | 28316 | -1 | 1618 | 0 | 23640 | -17016 | -1 | 21354 | 0 | 1234 | 4 | 36960 | -26550 | 0 | 24074 | 2 | -1970 | -9 |
| 10360 | 8736 | 1 | 36716 | 1 | 2128 | 0 | 23680 | -12874 | 1 | 12628 | 2 | 440 | 2 | 37000 | -29863 | -1 | 18911 | 2 | -1476 | -7 |
| 10400 | 4122 | -0 | 43492 | -1 | 2416 | 1 | 23720 | -7567 | -1 | 6890 | 0 | -420 | -0 | 37040 | -27350 | -1 | 13847 | 1 | -947 | -4 |
| 10440 | -3533 | -0 | 46420 | -0 | 2460 | 1 | 23760 | -3323 | 0 | 3941 | -1 | -1236 | -2 | 37080 | -20906 | -0 | 12474 | -0 | -188 | -0 |
| 10480 | -11860 | 1 | 44503 | 0 | 2258 | 0 | 23800 | -1190 | 2 | 2654 | 5 | -1881 | -4 | 37120 | -14110 | 1 | 15898 | -0 | 598 | 4 |
| 10520 | -18374 | 0 | 38145 | -1 | 1826 | 1 | 23840 | -724 | 0 | 2287 | 0 | -2240 | -4 | 37160 | -10067 | -3 | 22779 | -3 | 1322 | 7 |
| 10560 | -21175 | -0 | 29023 | -1 | 1198 | 1 | 23880 | -715 | -2 | 2758 | 1 | -2241 | -5 | 37200 | -10251 | 0 | 30438 | -1 | 1910 | 10 |
| 10600 | -19575 | 2 | 19658 | 0 | 431 | 0 | 23920 | 153 | 1 | 4140 | -3 | -1884 | -5 | 37240 | -14287 | -0 | 36075 | 1 | 2309 | 12 |
| 10640 | -14495 | 0 | 12622 | -1 | -394 | 1 | 23960 | 2665 | -0 | 7000 | 2 | -1240 | -3 | 37280 | -20307 | 1 | 37709 | 0 | 2478 | 12 |
| 10680 | -8307 | 3 | 9483 | 2 | -1174 | 1 | 24000 | 6291 | -3 | 12383 | -0 | -421 | -1 | 37320 | -25593 | 1 | 34805 | -0 | 2395 | 11 |
| 10720 | -3805 | -0 | 9944 | -2 | -1791 | -0 | 24040 | 9248 | 0 | 20726 | -1 | 452 | 1 | 37360 | -27454 | 1 | 28575 | -1 | 2056 | 9 |
| 10760 | -2531 | 1 | 11990 | -2 | -2131 | -0 | 24080 | 9534 | 1 | 31052 | 1 | 1275 | 3 | 37400 | -24309 | 2 | 21862 | -0 | 1481 | 6 |
| 10800 | -3616 | 1 | 13280 | -2 | -2121 | -1 | 24120 | 6043 | -0 | 41171 | 1 | 1964 | 5 | 37440 | -16812 | 2 | 18287 | 0 | 724 | 2 |
| 10840 | -4376 | 2 | 12848 | -2 | -1753 | -1 | 24160 | -852 | -1 | 48501 | -0 | 2458 | 6 | 37480 | -8354 | 0 | 20413 | 1 | -129 | -2 |
| 10880 | -2473 | -1 | 11885 | -0 | -1094 | -0 | 24200 | -9309 | -0 | 51036 | -0 | 2714 | 6 | 37520 | -3785 | -1 | 27468 | 1 | -953 | -6 |
| 10920 | 2191 | 1 | 12771 | -0 | -260 | 0 | 24240 | -16511 | -1 | 48145 | -0 | 2706 | 6 | 37560 | -5980 | 1 | 34733 | 3 | -1608 | -9 |
| 10960 | 7541 | -2 | 17083 | -1 | 617 | 0 | 24280 | -19535 | 0 | 41054 | -2 | 2428 | 5 | 37600 | -12855 | -0 | 36704 | 4 | -1975 | -10 |
| 11000 | 10908 | 0 | 24474 | -1 | 1424 | 1 | 24320 | -16519 | 2 | 32838 | 0 | 1893 | 4 | 37640 | -18876 | -2 | 31848 | 1 | -1992 | -10 |
| 11040 | 10528 | -1 | 33019 | -1 | 2073 | 1 | 24360 | -7907 | 1 | 27626 | 1 | 1145 | 2 | 37680 | -20075 | -0 | 23549 | 0 | -1678 | -8 |
| 11080 | 6171 | -0 | 40230 | -1 | 2504 | 1 | 24400 | 2815 | 1 | 28763 | 1 | 259 | 0 | 37720 | -16695 | -0 | 16612 | 1 | -1117 | -5 |
| 11120 | -970 | -0 | 43995 | -1 | 2682 | 0 | 24440 | 10048 | -2 | 36248 | -0 | -651 | -2 | 37760 | -11545 | -1 | 14023 | -1 | -627 | -1 |
| 11160 | -8760 | -0 | 43207 | 0 | 2594 | 0 | 24480 | 9514 | -2 | 45307 | -1 | -1445 | -3 | 37800 | -7516 | -2 | 16321 | -0 | 281 | 3 |
| 11200 | -14768 | -1 | 38082 | 1 | 2244 | 0 | 24520 | 2414 | -2 | 48903 | -3 | -1980 | -4 | 37840 | -6623 | -1 | 22332 | -1 | 923 | 7 |
| 11240 | -16989 | -2 | 30178 | 1 | 1662 | 0 | 24560 | -4598 | 2 | 43726 | -0 | -2157 | -5 | 37880 | -9947 | -1 | 29941 | -1 | 1439 | 10 |
| 11280 | -14592 | -2 | 22063 | 1 | 898 | 0 | 24600 | -5384 | 2 | 33387 | 2 | -1954 | -4 | 37920 | -17580 | 0 | 36640 | 1 | 1789 | 12 |
| 11320 | -8519 | -2 | 16484 | 1 | 30 | 0 | 24640 | 285 | -2 | 24655 | 2 | -1431 | -3 | 37960 | -28505 | -0 | 40015 | 1 | 1945 | 12 |
| 11360 | -1469 | -2 | 15023 | -1 | -833 | 0 | 24680 | 7951 | -0 | 21801 | 0 | -706 | -1 | 38000 | -40577 | 2 | 38287 | -3 | 1894 | 12 |
| 11400 | 3331 | -0 | 16784 | 1 | -1563 | -0 | 24720 | 13083 | 1 | 24978 | -2 | 87 | 1 | 38040 | -50755 | 1 | 30957 | -0 | 1634 | 10 |
| 11440 | 4496 | 1 | 18509 | -0 | -2030 | -1 | 24760 | 13455 | 1 | 31925 | 0 | 833 | 3 | 38080 | -55771 | -1 | 19422 | -0 | 1181 | 7 |
| 11480 | 4011 | 0 | 17172 | -1 | -2140 | -1 | 24800 | 8832 | -0 | 39832 | 1 | 1451 | 5 | 38120 | -53396 | -0 | 7241 | 1 | 577 | 3 |
| 11520 | 5384 | -1 | 13084 | -1 | -1874 | -1 | 24840 | 132 | 1 | 46207 | -1 | 1888 | 6 | 38160 | -44158 | 1 | -623 | 2 | -110 | -1 |
| 11560 | 9846 | -0 | 9663 | -1 | -1297 | -0 | 24880 | -11003 | 1 | 49139 | -0 | 2111 | 6 | 38200 | -32418 | -1 | -260 | 0 | -781 | -5 |
| 11600 | 15350 | 2 | 10122 | 0 | -535 | -0 | 24920 | -22362 | 2 | 47501 | -2 | 2106 | 6 | 38240 | -24797 | -0 | 7809 | 2 | -1322 | -9 |
| 11640 | 19000 | -1 | 15321 | 0 | 267 | -0 | 24960 | -31373 | 3 | 41282 | -1 | 1871 | 5 | 38280 | -25381 | -1 | 17743 | 1 | -1632 | -11 |
| 11680 | 19013 | 1 | 24186 | 1 | 988 | 0 | 25000 | -35589 | 0 | 31923 | 0 | 1427 | 4 | 38320 | -31858 | -1 | 22679 | 1 | -1654 | -10 |
| 11720 | 14701 | 0 | 34839 | 2 | 1553 | 1 | 25040 | -33574 | 1 | 22408 | 0 | 811 | 2 | 38360 | -37604 | -1 | 20558 | 0 | -1393 | -9 |
| 11760 | 5999 | 0 | 45152 | 2 | 1917 | 1 | 25080 | -26064 | 0 | 16622 | -1 | 90 | 0 | 38400 | -37579 | -2 | 14962 | 1 | -905 | -5 |
| 11800 | -6559 | -2 | 52959 | 3 | 2061 | 1 | 25120 | -16690 | 1 | 17562 | -0 | -641 | -2 | 38440 | -31529 | -3 | 11072 | -1 | -271 | -1 |
| 11840 | -21641 | -1 | 56265 | 1 | 1983 | 1 | 25160 | -10895 | 1 | 24795 | 1 | -1268 | -3 | 38480 | -22752 | -1 | 11767 | -1 | 425 | 3 |
| 11880 | -36992 | -2 | 53673 | 3 | 1696 | 1 | 25200 | -12294 | -1 | 33421 | 1 | -1676 | -5 | 38520 | -15233 | -2 | 16617 | -2 | 1104 | 7 |
| 11920 | -49600 | -3 | 44962 | 2 | 1225 | 0 | 25240 | -19041 | 0 | 37173 | 0 | -1784 | -5 | 38560 | -11603 | -0 | 23083 | -1 | 1693 | 10 |
| 11960 | -56295 | -4 | 31663 | 2 | 616 | 0 | 25280 | -24862 | 0 | 33835 | -2 | -1576 | -5 | 38600 | -12475 | -1 | 28291 | -0 | 2127 | 12 |
| 12000 | -54900 | -4 | 17327 | 1 | -67 | -0 | 25320 | -24551 | -1 | 26936 | -1 | -1098 | -4 | 38640 | -16753 | 0 | 30235 | -1 | 2352 | 13 |
| 12040 | -45785 | -3 | 6858 | -2 | -739 | -0 | 25360 | -17845 | -2 | 22019 | -1 | -437 | -2 | 38680 | -22387 | 0 | 28138 | -1 | 2335 | 13 |
| 12080 | -32912 | -1 | 4361 | -2 | -1299 | -0 | 25400 | -8463 | 1 | 22226 | -1 | 308 | -0 | 38720 | -27150 | 1 | 22376 | -0 | 2068 | 11 |
| 12120 | -22624 | -1 | 10010 | 0 | -1645 | -0 | 25440 | -867 | 0 | 26961 | -0 | 1045 | 2 | 38760 | -29220 | 1 | 14297 | -0 | 1562 | 8 |
| 12160 | -19379 | -1 | 18809 | 1 | -1703 | -0 | 25480 | 2132 | 1 | 33270 | 1 | 1689 | 4 | 38800 | -27654 | 2 | 5973 | -0 | 858 | 4 |
| 12200 | -21701 | -0 | 24174 | -0 | -1457 | 0 | 25520 | 63 | -0 | 37993 | 0 | 2166 | 6 | 38840 | -22793 | 2 | -257 | 0 | 33 | -1 |
| 12240 | -23561 | 1 | 23750 | 0 | -951 | 0 | 25560 | -5707 | 1 | 39182 | -1 | 2415 | 6 | 38880 | -16433 | -0 | -2637 | 2 | -803 | -5 |
| 12280 | -20240 | 2 | 20802 | 0 | -275 | 1 | 25600 | -12943 | 0 | 36349 | -0 | 2404 | 6 | 38920 | -11244 | -1 | -1068 | 2 | -1513 | -8 |
| 12320 | -11989 | 4 | 20119 | 1 | 472 | 1 | 25640 | -19421 | 1 | 30083 | -1 | 2127 | 6 | 38960 | -9199 | -0 | 2509 | 1 | -1966 | -10 |
| 12360 | -2705 | 1 | 23744 | 2 | 1198 | 1 | 25680 | -23447 | 1 | 21644 | -1 | 1605 | 4 | 39000 | -10059 | -0 | 5377 | 2 | -2081 | -10 |
| 12400 | 3453 | 2 | 30142 | 2 | 1823 | 2 | 25720 | -24094 | 2 | 12691 | -0 | 884 | 2 | 39040 | -11658 | 1 | 6192 | -0 | -1850 | -9 |
| 12440 | 4348 | 2 | 36105 | 1 | 2277 | 2 | 25760 | -21363 | 1 | 5051 | 2 | 42 | 1 | 39080 | -11863 | -1 | 5818 | 1 | -1331 | -6 |
| 12480 | 271 | 1 | 38998 | 0 | 2499 | 2 | 25800 | -16301 | 3 | 305 | 2 | -812 | -1 | 39120 | -10139 | -4 | 6249 | -1 | -624 | -3 |
| 12520 | -6935 | -0 | 37739 | -1 | 2457 | 2 | 25840 | -10827 | 1 | -878 | 3 | -1543 | -3 | 39160 | -7577 | -1 | 9025 | 1 | 164 | 7 |
| 12560 | -15089 | 0 | 32539 | 1 | 2147 | 2 | 25880 | -6889 | 2 | 683 | 3 | -2018 | -5 | 39200 | -5954 | 1 | 14395 | 0 | 935 | 6 |
| 12600 | -22459 | 0 | 24232 | -1 | 1596 | 2 | 25920 | -5166 | -1 | 3043 | 1 | -2144 | -5 | 39240 | -6741 | -0 | 21321 | -1 | 1609 | 9 |
| 12640 | -27854 | -0 | 13752 | -0 | 855 | 1 | 25960 | -4563 | -0 | 4655 | -1 | -1900 | -5 | 39280 | -10449 | -1 | 27934 | -3 | 2173 | 12 |

## Table 7 (Cont.)

| t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration | t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration | t (days) | $\Delta x_2$ Numerical integration | $\Delta x_2$ Analytical minus integration | $\Delta y_2$ Numerical integration | $\Delta y_2$ Analytical minus integration | $\Delta z_2$ Numerical integration | $\Delta z_2$ Analytical minus integration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12680 | -30460 | 1 | 1951 | -1 | 0 | 0 | 26000 | -3367 | -1 | 5655 | -0 | -1344 | -4 | 39320 | -16356 | 0 | 32185 | -1 | 2434 | 13 |
| 12720 | -29476 | 2 | -10215 | -1 | -863 | -0 | 26040 | -885 | 0 | 7488 | -0 | -583 | -2 | 39360 | -22616 | 1 | 32556 | -1 | 2512 | 13 |
| 12760 | -24278 | 0 | -21258 | -1 | -1609 | -1 | 26080 | 2086 | 0 | 11507 | 2 | 260 | 0 | 39400 | -26813 | -0 | 28795 | -1 | 2342 | 11 |
| 12800 | -15057 | -1 | -29317 | -2 | -2107 | -1 | 26120 | 3969 | 0 | 17955 | 0 | 1075 | 3 | 39440 | -26904 | -1 | 22389 | -1 | 1927 | 9 |
| 12840 | -3592 | -1 | -31426 | -1 | -2255 | -1 | 26160 | 3412 | -1 | 25821 | -0 | 1773 | 5 | 39480 | -22316 | 1 | 16329 | -1 | 1295 | 5 |
| 12880 | 7120 | -1 | -27965 | -2 | -2016 | -1 | 26200 | -1 | -1 | 33251 | -3 | 2294 | 6 | 39520 | -14749 | 3 | 13839 | 1 | 501 | 0 |
| 12920 | 14583 | -2 | -20202 | -1 | -1439 | -1 | 26240 | -5446 | -0 | 38180 | -1 | 2596 | 7 | 39560 | -7921 | 1 | 16373 | 1 | -358 | -4 |
| 12960 | 18163 | -1 | -10495 | 0 | -637 | -1 | 26280 | -10972 | 1 | 39047 | -1 | 2657 | 7 | 39600 | -5620 | 0 | 22091 | 1 | -1155 | -8 |
| 13000 | 18666 | -2 | -413 | -0 | 256 | -1 | 26320 | -14107 | 1 | 35550 | 1 | 2473 | 7 | 39640 | -8771 | -1 | 26640 | 0 | -1753 | -11 |
| 13040 | 17029 | -2 | 9586 | -2 | 1114 | -0 | 26360 | -12896 | -1 | 29198 | 2 | 2052 | 6 | 39680 | -14318 | -0 | 26545 | 2 | -2045 | -11 |
| 13080 | 13597 | 0 | 19394 | -0 | 1844 | -0 | 26400 | -7040 | -1 | 23084 | 1 | 1422 | 4 | 39720 | -17741 | -2 | 22131 | 1 | -1991 | -10 |
| 13120 | 8341 | 1 | 28467 | 3 | 2381 | 0 | 26440 | 1433 | -0 | 20465 | 0 | 634 | 2 | 39760 | -16706 | -2 | 16809 | 1 | -1623 | -7 |
| 13160 | 1501 | -1 | 35603 | 4 | 2691 | 1 | 26480 | 8647 | 2 | 22622 | 1 | -227 | -0 | 39800 | -12149 | -1 | 14085 | 1 | -1022 | -3 |
| 13200 | -5881 | -1 | 39300 | 2 | 2756 | 1 | 26520 | 10998 | 1 | 27405 | 1 | -1045 | -3 | 39840 | -6827 | -2 | 15505 | 0 | -289 | 1 |
| 13240 | -11935 | -2 | 38501 | 2 | 2576 | 1 | 26560 | 8120 | 0 | 30268 | -1 | -1687 | -5 | 39880 | -3464 | -1 | 20494 | -0 | 476 | 5 |
| 13280 | -14573 | -3 | 33472 | 2 | 2163 | 1 | 26600 | 3855 | 1 | 28032 | -1 | -2036 | -6 | 39920 | -3696 | 1 | 27171 | -0 | 1185 | 9 |
| 13320 | -12509 | -2 | 26254 | 2 | 1546 | 1 | 26640 | 3145 | 1 | 22052 | -2 | -2032 | -6 | 39960 | -7816 | -1 | 33252 | 0 | 1766 | 11 |
| 13360 | -6231 | -1 | 20042 | 0 | 772 | 1 | 26680 | 7662 | 1 | 16948 | -1 | -1690 | -4 | 40000 | -14893 | -0 | 36721 | -1 | 2162 | 13 |
| 13400 | 1695 | -1 | 17478 | 0 | -83 | -0 | 26720 | 14938 | -1 | 16518 | -1 | -1091 | -3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 7. ACKNOWLEDGMENTS

I wish to acknowledge the continuous interest and encouragement given by Drs. F. L. Whipple and C. A. Lundquist. I also express my gratitude to Dr. G. Clemence for his valuable advice and his numerous illuminating discussions. I wish to extend my thanks to Drs. P. Musen, R. Broucke, and M. Davies for clarifying and constructive discussions. My thanks also to Mrs. Yun-Ying Fang, from the SAO's programing department, who programed the multiplication-of-series program used in this work. I thank Drs. A. Allison and B. Marsden for discussing various aspects of the problem with me.

## REFERENCES

BROUWER, D., and CLEMENCE, G. M.

1961. Methods of Celestial Mechanics. Academic Press, New York, 598 pp. (2nd printing, 1965).

HAMID, S. E.

1968. First-order planetary theory, perturbations in rectangular coordinates, Hansen's variables, longitude, and distance. Smithsonian Astrophys. Obs. Spec. Rep. No. 285, 35 pp.

## BIOGRAPHICAL NOTE

SALAH E. HAMID received his B. S. C. from Cairo University in 1944 and his Ph. D. in astronomy from Harvard in 1950.

Dr. Hamid was an assistant professor of astronomy on the Faculty of Sciences, Cairo University, and has also held the position of director of the Operation Research Center of the National Planning Institute of Cairo, the U. A. R. He joined SAO in 1961 as a celestial mechanician.

NOTICE

This series of Special Reports was instituted under the supervision of Dr. F. L. Whipple, Director of the Astrophysical Observatory of the Smithsonian Institution, shortly after the launching of the first artificial earth satellite on October 4, 1957. Contributions come from the Staff of the Observatory.

First issued to ensure the immediate dissemination of data for satellite tracking, the reports have continued to provide a rapid distribution of catalogs of satellite observations, orbital information, and preliminary results of data analyses prior to formal publication in the appropriate journals. The Reports are also used extensively for the rapid publication of preliminary or special results in other fields of astrophysics.

The Reports are regularly distributed to all institutions participating in the U. S. space research program and to individual scientists who request them from the Publications Division, Distribution Section, Smithsonian Astrophysical Observatory, Cambridge, Massachusetts 02138.